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New Business in Steady Flow

Mills Enjoy Best Bookings in Months—Steel Corporation Is Large Buyer of Pig Iron—Sales of Foreign Steel on Atlantic Coast Cause Concern—January Pig Iron Production Shows First Gain Since May

INCOMING tonnage of new business in steel is notable for its steady day-to-day character in large volume. This points to a healthy state of consumption based on a wide variety of new enterprise and of expanding industrial activity. January business with the most representative producers was the best in at least ten months. With most mills it was well in excess of output. As a result another substantial increase is expected in the unfilled tonnage of the Steel corporation for January, the statement on which will be out this week.

The general tendency of production still is upward. With the Steel corporation, however, it has now reached so high a point that the week-to-week changes are slight. This week the largest producer is operating at 91.5 per cent of steel ingot capacity which is a shade down from the peak point of last week.

Buy Against Strike

Entrance of the Steel corporation into the pig iron market has caused some stir and is ascribed to a desire to accumulate raw material against the possibility of a bituminous coal strike. The steel industry, generally, however, regards the strike outlook as more favorable, and believes a suspension, if it does occur, will not be long-continued or of extensive effect. The National Tube Co. has closed for a round lot of basic iron for Lorain, O., estimated at 40,000 to 60,000 tons. The American Bridge Co., another Steel corporation subsidiary, is inquiring for 10,000 to 15,000 tons of the same grade for Pencoyd, Pa. Other interests apparently have been considering the coal situation in providing future raw material requirements. A negotiation of 50,000 tons of sheet bars at Pittsburgh is believed to originate in part from this cause.

Sales of pig iron have been heavy all along the line due to active covering for second quarter. A sanitary interest purchased 36,000 tons and an eastern pipe maker 10,000 tons. A northern Ohio steelmaker has negotiated a large tonnage of basic with the Ford Motor Co. on a reported trade basis. Iron prices are gradually rising.

IRON TRADE REVIEW composite of fourteen leading iron and steel products still is rising slowly. It registers $43.49 this week against $43.39 last week.

Ferromanganese after going to $106.50 seaboard has re-established itself at $107.50 but buyers hold off.

Home Mills Outbid

Heavier offerings of foreign steel along the Atlantic seaboard far below the equivalent American price are the cause of considerable concern among domestic producers. Sales of at least 6000 tons of structural shapes recently have been made delivered to eastern consumers by Belgian and Luxemburg mill about $10 per ton below the common quotation of America producers, although the latter have gone considerably lower to meet this competition. A heavier tonnage may have been closed as negotiations have been going forward quietly. The $3 per ton duty on structural shapes has been of little effect. Sales of foreign pig iron to consumers along the Atlantic seaboard the past week are estimated at 10,000 to 15,000 tons. A Belgian manufacturer of cast iron pipe has taken 2250 tons for Los Angeles about $7 per ton under the price of American foundries.

Railroad car repair orders are numerous. Chicago reports 1500 placed with 2500 in the market. The expected inquiry from the Pennsylvania for 10,000 car bodies is about to be issued. The 4000 cars wanted by the Norfolk & Western will require 60,000 tons of rolled material. The backward locomotive market has been helped by the award of 70 by the New York Central.

Iron Output Upward

Pig iron production measuring the increased vigor of the whole iron and steel industry, reversed itself in January and for the first time in seven months showed an increase. Total output was 3,017,444 tons compared with 2,912,519 tons in December, a gain of 104,925 tons. The daily average grew from 93,952 to 97,337 tons or 3.6 per cent. The most significant gain was in the number of furnaces put in service, 18 have been blown in and only one blown out in the month, a net gain of 17. Of this number 14 were steelworks furnaces. The active stacks January 31 totaled 248, the largest since September.

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Improving Machinery and Equipment Items

IF YOU are identified directly or indirectly with the manufacture, distribution, or operation of machine tools you are sure to profit from the editorial contents of this issue. If you sell tools or machinery you will find that the article on page 420, "Is Display Room Worth While?", will help you to answer one of the pressing questions in your business.

Machining Parts for Vault Doors (See Page 415)

Again, if you operate machine tools, or are a potential buyer, you will want to read the announcements of new equipment on pages 423-429, inclusive. Be sure to read the explanatory note on page 423, showing how to obtain the greatest benefit from descriptions of new tools.

Beginning on page 415 you will find an interesting article explaining how bank vault builders utilize alloy steel and accurate machinery to outwit safebreakers.

Do You Know That—

IRON TRADE REVIEW subscribers operate 5619 machine shops, 1035 automatic machine departments, 1296 stamping and drawing departments, 3708 toolrooms, 3714 pattern shops, 2736 forge shops and 2137 fabricating shops.

Pig Iron Movement Expanding

Sales and Inquiries Much Heavier for Second Quarter Requirements—Some Sellers Already Heavily Committed—Basic Market Active, Leading Tube Maker Placing 40,000 to 60,000 Tons—Prices Show Strength

PITTSBURGH, Feb. 5.—Activity is more pronounced in the pig iron market, mainly for the second quarter. The National Tube Co. has bought a large tonnage of basic iron but will give no details concerning the transaction. An interest generally credited with taking the order denies it. The tonnage is estimated at 40,000 to 60,000 tons. Shipments are to start immediately to the Lorain, O. plant. The Central Steel Co. is understood to have purchased a large tonnage of basic on some exchange basis with the Ford Motor Co., Detroit, for second quarter. Follansbee Bros. Co. has purchased 5000 tons of basic at $22, valley, but the Shenango Furnace Co., Struthers Furnace Co., McKinney Steel Co. and other sellers now quote a minimum of $23. The Allen S. Davison Co. still is negotiating for 6000 tons, and at least two scrap interests still are inquiring for basic iron. The American Bridge Co. is inquiring for 10,000 to 15,000 tons of basic for its Pencoyd, Pa., plant.

The Allegheny Steel Co. has closed for 3000 tons of bessemer iron at $23, valley, the merchant furnace taking the order now quoting $24, minimum, the same as other sellers. Standard Sanitary Mfg. Co. purchased 36,000 tons last week for the second quarter for various plants including 11,000 tons for Louisville, 2250 tons for Birmingham, 5000 tons of northern foundry iron for the same plant, and 20,000 tons of Allegheny and New Brighton. The valley base price was $23. Several 500 and 1000-ton lots have been closed since at $24, valley, for the second quarter. Small prompt tonnages are taking a price of $23.25 to $23.50, some sellers naming these figures for the remainder of the first quarter. One or two quote $24, minimum. The National Radiator Co., Johnstown, Pa. has purchased a few thousand tons for its various plants. One Pennsylvania furnace is selling 500 tons for Johnstown, Pa. at $23.50, furnace, another is selling a larger tonnage for a New Castle plant. The Union Radiator Co., Johnstown, Pa., bought 1500 tons from a nearby source around $23. The Westinghouse Air Brake Co. is reported to have placed a large tonnage for second quarter. Average sales prices for basic and bessemer pig iron as compiled for January by W. P. Snyder & Co., are $22 and $23, valley respectively. These compare with $20.857 and $22.775, respectively in December.

Inquiry Further Improves

Boston, Feb. 5.—Eastern pig iron buying still is relatively quiet, but inquiry is persistent and a heavy tonnage may be placed within the coming week. One of the eastern Pennsylvania sellers has advanced its prices 50 cents within the last few days. With one exception Buffalo furnaces are on a $23 base, although an occasional lot of resale iron still makes its appearance. Sales of the past week include two 500-ton lots and a half dozen or more scattered lots of 200 to 300 tons. One sale was for several hundred tons of malleable at $22.50, eastern Pennsylvania, or $26.15 delivered. A few sales of No. 2X iron (2.25 to 2.75 silicon), have been made from the eastern Pennsylvania district at this same figure, namely $26.15 delivered. At least 500 tons of No. 2X has been placed at $23.50, eastern Pennsylvania or $27.15, delivered, and several hundred tons of this same grade at $23.50, Buffalo, equivalent to $28.40 delivered.

New York Sales 25,000

New York, Feb. 5.—Pig iron buying here has expanded. During the past week sales in this territory aggregated 25,000 tons, some of which tonnage, however, is for shipment outside the territory. Inquiries for more than 15,000 tons now are pending. A few days ago prices eased off somewhat. Sales of eastern foundry were made at $22 base furnace for February and March shipment with some runover into the second quarter, while second quarter alone was booked at $22.50 base furnace. With the increased business on books and with an increased volume of inquiry pending, the furnaces are asking $22.50 to $23 base furnace for February and March and $23 base on second quarter. On Buffalo and Central Pennsylvania foundry the quotation is around $22 base furnace. On Virginia foundry the market continues $25 to $26 base furnace.

A large user in New Jersey has placed 10,000 tons of foundry iron for second quarter.

Good Inquiry at Buffalo

Buffalo, Feb. 5.—With the best aggregate inquiry in months, local makers are certain that a buying movement of considerable proportions has set in. Total inquiry for the week has been between 25,000 and 30,000 tons. Individual inquiries range from carload lots of foundry and malleable for various grades of silicon, up to one for 3000 tons of foundry. One seeks 2500 tons of foundry, another 2000 tons and two other inquiries of size are for 1500 and 1600 tons of foundry iron. Total selling is not less than 20,000 to 25,000 tons it is believed, showing a definite buying interest for first half. Most of the present business is for second quarter and one maker is asking $22, minimum, for second quarter and $23 minimum for first. Another maker will not quote less than $23 on anything.

Good Sales for Second Quarter

Cleveland, Feb. 5.—Second quarter business in the pig iron market is developing steadily and in large volume. The movement recently has acquired such proportions that one important interest has committed fully half of its output for that period, including tonnage to be delivered on standing contracts. This seller has booked in the last few days 25,000 tons of foundry iron, most of which is for delivery in the second quarter. With but one exception, the interests here represented in the northern Ohio group are active in quoting and taking contracts for April, May and June, at substantially the same prices as prevail for iron to be shipped during February and March. The foundry iron market is strong at $24 in this and adjoining territory. Cleveland makers have booked tonnages at $24, furnace, for delivery in the 50-cent switching area, in this and the second quarter. The valley market is quotable at $24, and the same applies to southern Ohio, and furnaces west of here, while a minimum of $22 is reported for Buffalo. The 50-cent differentials are prevailing on sales from valley furnaces, as shown by some recent transactions in No. 2X iron at $24.50. The valley market is more active than in some weeks, and buyers seem more anxious to close on inquiries. One interest with headquarters here has before it this week new inquiries for 15,000 tons of foundry and malleable grades, while another has inquiries for 10,000 tons. A Cleveland melter is in the market for 1000 tons. Some makers are holding basic at $24, valley, but purchases have been made at a lower figure, and a firm price of $23 is reported as the representative figure. A purchase of around 6000 tons is noted. Other large sales of basic appear to have gone to valley interests. A northern Ohio steelmaker, is reported to have closed for second quarter tonnage; if its full requirements were placed this would mean 40,000 to 50,000 tons. A local maker is holding basic at $24.

Southern Ohio Sales Increasing

Cincinnati, Feb. 5.—Pig iron buying continues to expand, recent sales in this territory aggregating 7000 tons. Inquiry approximates 3000 tons, and some other lots are under negotiation quietly. The southern Ohio market is firmly established at $24, Ironton base for spot shipment. Producers are demanding 50c to $1 a ton more for second quarter, although a leading furnace interest is not interested in tonnages for that period. While the opinion prevails here to some extent that the southern market is firm at $23, Birmingham base, $22.50 can be done with at least two furnace interests for this quarter. The Belfont Iron Works, Ironton, reports its yard stocks are small and shipments equal to daily production of its furnace. The Marting Iron & Steel Co., Ironton, plans to put into blast its Ironton furnace about the middle of this month. Most of the recent sales specify prompt shipment, or during the remainder of this quarter. The United States Cast Iron Pipe Co., is reported to have bought

5000 tons of off-grade northern iron for its plant at Addyston, O. A sale of 500 tons of northern iron to the Dayton Malleable Co., Dayton, O., is noted, also a like tonnage of the same grade to the Superior Gas Engine Co., Springfield, O. Other sales include 350 tons of northern iron to the Iron Products Co., ister Co., Dayton, O. and 500 tons of northern iron the Iron Products Co., Co-Columbus, O. The Globe Stove & Range Co., Kokomo, Ind., is reported to have bought 1500 tons of Chicago iron.

St. Louis Quiet and Firm

St. Louis, Feb. 4.—Sales of pig iron during the past several days have involved small tonnages. The market holds firm, with prices in some instances slightly higher. Shipments continue heavy, and there is a general desire on the part of melters to get their material in. Numerous requests to anticipate contract quotas are reported. The melt is gradually increasing, with the best gain among jobbing foundries. The largest inquiry reported was from an Illinois melter for 300 to 500 tons of foundry iron for second quarter. A consumer in In- at $23, with one producer asking $24 for second quarter. Northern iron is quoted at $24 to $24.50, but not much is to be had at the lower figure. The leading local producer continues to quote $25.50 to $26, f.o.b. Granite City.

Market Is Stronger

Birmingham, Ala., Feb. 4.—Furnace interests in the Birmingham district have been selling pig iron for second quarter but mostly to southern consumers and in small lots. Quotations are firm at $23 for No. 2 foundry. Concessions are rare and $22.50, base, has been withdrawn. Production is being shipped steadily and some inroads are being made on stocks.

Market Most Active Since Fall

Philadelphia, Feb. 5.—Pig iron buying is more active now than at any time since last fall. At least 40,000 tons was placed in the New York and Philadelphia territories during the past week with additional orders being placed daily. It is expected that an additional 40,000 tons will be placed before the end of this week. This tonnage does not include foreign iron sold totaling 10,000 to 15,000 tons. French pig iron of normal analysis excepting high phosphorus sold during the past week around $22 to $22.50, duty paid tidewater. It is understood some foreign iron was sold to Virginia consumers around $25 delivered and that some further foreign tonnage is under negotiation. While most of the activity is in foundry iron, basic also is being bought, current inquiries for the latter grade involving from 18,000 to 20,000 tons. Despite foreign competition, eastern prices on foundry iron show an advancing tendency. Some business during the past week brought $22, base eastern furnace, but most makers now are holding to $23, and $22.50 appears to be exceptional. Due to foreign competition, low phosphorus iron is lower with $27, furnace, or a reduction of $1, now being quoted on copper bearing low phosphorus. Virginia foundry iron now is at $25 to $26, base furnace, although the bulk of the current business being booked in this grade is bringing $26, base.

Inquiries and Sales Lower

Chicago, Feb. 5.—Iron at $24 Chicago aparently has entirely disappeared from the market and it is claimed all sales are being made at $24.50, furnace. One small producer is asking $25, an advance of 50 cents, for prompt delivery. Consumers are showing no rush to cover; in fact, inquiries and sales are slightly lower in volume. Business, however, although quiet, is comfortable in the aggregate. A fair amount of production for second quarter already is sold. A Richmond, Ind., melter is closing on 500 tons each of northern and southern foundry iron for second quarter. A Racine, Wis., melter bought 2000 tons of foundry iron and 1000 tons of malleable. A Rockford, Ill., melter is seeking 200 tons of foundry iron. The lowest price quoted on southern iron is $23, Birmingham, but sales are light. In anticipation of an increase in charcoal iron, sellers are not pushing sales. Numerous sales in carloads up to 100 tons are being made at $26 furnace. A Chicago steel foundry was quoted $32.50 on 500 tons of low phosphorus. A Racine, Wis., melter has recently closed on 300 tons of silveries.

Prices Present and Past

Representative market figures yesterday, and for last month, three months ago and one year ago

	Feb. 6, 1924	Jan., 1924	Nov., 1923	Feb., 1923
PIG IRON				
Bessemer, valley del., Pitts.....	$24.77	24.67	25.47	29.57
Basic, valley	22.00	21.40	20.80	26.10
Basic, eastern del., eastern Pa...	22.50	22.50	22.60	28.15
*No. 2 foundry, del. Pitts.....	24.77	24.17	23.77	28.77
*No. 2 foundry, Chicago.....	24.50	23.70	23.30	29.75
*Southern No. 2, Birmingham...	22.50	21.60	19.25	24.50
*Southern Ohio, No. 2, Ironton.	24.00	22.90	22.50	28.40
**No. 2X, Virginia furnace.....	26.00	25.00	25.00	27.50
**No. 2X, eastern del., Phila..	24.26	24.26	23.01	30.10
Malleable, valley	23.00	22.00	20.40	27.25
Malleable, Chicago	24.50	23.70	23.30	29.75
Lake Superior charcoal, Chicago	29.04	29.04	28.64	33.54
Gray forge, val. del. Pittsburgh	24.77	23.57	23.27	27.87
Ferromanganese, del., Pitts.....	112.29	113.79	113.79	112.29
SEMIFINISHED MATERIAL				
Sheet bars, bessemer, Pittsburgh.	42.50	42.50	42.50	39.25
Sheet bars, open-hearth, Pitts....	42.50	42.50	42.50	39.25
Billets, bessemer, Pittsburgh.....	40.00	40.00	41.50	38.85
Billets, open-hearth, Pittsburgh..	40.00	40.00	41.50	38.50
FINISHED MATERIAL				
Steel bars, Pittsburgh.....	2.40	2.40	2.40	2.15
Steel bars, Chicago	2.50	2.50	2.50	2.21
Steel bars, Philadelphia.....	2.72	2.72	2.72	2.525

*1.75 to 2.25 silicon. **2.25 to 2.75 silicon.

	Feb. 6, 1924	Jan., 1924	Nov., 1923	Feb., 1923
FINISHED MATERIAL (Continued)				
Iron bars, Philadelphia.....	$2.57	2.57	2.62	2.45
Iron bars, Chicago mills.....	2.40	2.40	2.40	2.46
Beams, Pittsburgh.....	2.50	2.50	2.50	2.15
Beams, Philadelphia	2.67	2.72	2.72	2.525
Beams, Chicago	2.60	2.60	2.60	2.31
Tank plates, Pittsburgh.....	2.50	2.50	2.50	2.15
Tank plates, Philadelphia.....	2.67	2.72	2.72	2.525
Tank plates, Chicago.....	2.60	2.60	2.60	2.31
Sheets, blk., No. 28, Pittsburgh.	3.75	3.75	3.75	3.35
Sheets, blue anl., No. 10, Pitts.	2.90	2.95	3.00	2.50
Sheets, galv., No. 28, Pittsburgh	4.90	4.95	4.85	4.35
Wire nails, Pittsburgh.....	3.00	3.00	3.00	2.75
COKE				
Connellsville furnace	4.00	3.80	3.80	7.20
Connellsville foundry, ovens....	4.25	4.35	4.85	8.60
OLD MATERIAL				
Heavy melting steel, Pittsburgh.	22.00	21.10	15.70	23.40
Heavy melting steel, eastern Pa.	19.75	18.15	15.50	21.20
Heavy melting steel, Chicago...	18.00	17.40	13.80	19.75
No. 1 wrought, eastern Pa....	22.00	20.10	17.75	24.10
No. 1 wrought, Chicago.....	17.50	17.50	14.10	20.50
Rails for rolling, Chicago.....	20.00	18.90	15.10	22.00

Composite Market Average

Representing the Combined Average Prices Per Ton of Fourteen Leading Iron and Steel Products Yesterday, One Week, One Month, Three Months, One Year and Ten Years Ago.

Feb. 6, 1924	Jan. 30, 1924	Jan., 1924	Nov., 1923	Feb., 1923	Feb., 1914
$43.49	$43.39	$43.26	$42.81	$42.61	$25.53

Products Included Are Pig Iron, Billets, Slabs, Sheet Bars, Wire Rods, Steel Bars, Plates, Structural Shapes, Black, Galvanized and Blue Annealed Sheets, Tin Plate, Wire Nails and Black Pipe

Iron and Steel Prices

SCRAP PRICES, PAGE 446, WAREHOUSE PAGE 442, ORE, NUTS, BOLTS AND RIVETS AND PIPE PRICES, PAGE 444

Pig Iron

Prices per gross ton

Bessemer, valley	$23.00 to 24.00
Bessemer, Pittsburgh	24.77 to 25.77
Basic, valley	22.00 to 23.00
Basic, Pittsburgh	23.77 to 24.77
Basic, Buffalo	23.00
Basic, del., eastern Pa.	22.26 to 22.76
Malleable, valley	23.00 to 24.00
Malleable, Pittsburgh	24.77 to 25.77
Malleable, Chicago	24.00 to 24.50
Malleable, Buffalo	22.00 to 23.00
Malleable, del., eastern Pa.	24.00 to 25.00

FOUNDRY IRON SILICONS

No. 2 Northern	1.75 to 2.25
No. 2 Southern foundry	1.75 to 2.25
No. 2X East'n and Virginia	2.25 to 2.75
No. 1X Eastern	2.75 to 3.25
No. 1 Chicago	2.25 to 2.75
No. 2 foundry Eastern	1.75 to 2.25

No. 1X, eastern del., Phila.	24.76
No. 1X, Buffalo	23.50 to 24.50
No. 2 foundry, valley	23.00 to 24.00
No. 2 foundry, Pittsburgh	24.77 to 25.77
No. 2 foundry, Buffalo	22.00 to 23.00
No. 2 foundry, Chicago	24.00 to 24.50
No. 2 foundry, Granite City	25.50 to 26.00
No. 2 foundry, Ironton furnace	24.00
No. 2 foundry, Cleveland, del.	24.50
No. 2 foundry, del., Phila.	23.76
No. 2 foundry, N. J. tidewater	24.13
No. 2X, eastern del., Phila.	24.26
No. 2X, east, N. J. tidewater	24.63
No. 2X, eastern del., Boston	26.65 to 27.15
No. 2X foundry, Buffalo fur.	22.50 to 23.50
No. 2X, Buffalo, del. Boston	27.40 to 27.90
No. 2 southern, Birmingham	23.00
No. 2 southern, Cincinnati	27.05
No. 2 southern, Chicago	29.01
No. 2 southern, Philadelphia	30.80
No. 2 southern, Cleveland	29.01
No. 2 southern, Boston (rail and water)	29.91
No. 2 southern, St. Louis	28.17
No. 2X, Virginia furnace	25.00 to 26.00
No. 2X, Virginia, Phila.	29.77 to 30.57
No. 2X, Virginia, Jersey City	30.04 to 31.04
No. 2X, Virginia, Boston	30.92 to 31.92
Gray forge, eastern Pa.	22.50
Gray forge, val. del., Pitts.	24.77
Low phos., standard, valley	29.00
Low phos., standard, Phila.	nominal
Low phos., Lebanon, furnace	27.00
Charcoal, Birmingham	33.00 to 34.00
Charcoal, Superior, Chicago	29.04

Silvery Iron

Jackson County, Ohio, furnace

7 to 8 per cent	32.00
8 to 9 per cent	33.50
9 to 10 per cent	35.50
10 to 11 per cent	37.50
11 to 12 per cent	40.00
12 per cent	42.50

Bessemer Ferrosilicon

Jackson County, Ohio, furnace

10 to 11 per cent	42.50
11 to 12 per cent	45.00
12 to 13 per cent	47.50

Ferroalloys

†Ferromanganese 78 to 82 per cent, tidewater, or furnace first hand and resale	107.50
Ferromanganese, delivered, Pittsburgh	112.29
Spiegeleisen 19 to 21 per cent furnace or tidewater	38.00 to 40.00
Ferrosilicon, 50 per cent contract freight allowed	75.00
Ferrotungsten standard, cents per pound contained	85.00 to 95.00
Ferrochrome, 60 to 70 chromium, 6 to 8 carbon, cents per pound contained, delivered	10.00 to 10.25
Ferrovanadium, 30 to 40 per cent per pound estimated, according to analysis	$3.50 to $4.00
Ferro carbon-titanium, carloads, producer's plant, per net ton	$200.00

†Duty paid.

Coke

Beehive, Ovens

Prices per net ton

Connellsville furnace	$3.75 to 4.25
Connellsville foundry	4.75 to 5.50
New River foundry	11.00 to 11.50
Wise county furnace	4.50 to 5.75
Wise county foundry	5.75 to 6.50
Alabama furnace	5.25 to 6.25
Alabama foundry	5.50 to 6.50

By-Product

Foundry, Newark, N. J., del.	$10.91
Foundry, Chicago, ovens	12.50
Foundry, Boston, delivered	12.50
Foundry, St. Louis	12.50
Foundry, Granite City, Ill.	12.50
Foundry, Alabama	5.50 to 6.50

Semifinished Material

Prices per gross ton

BILLETS AND BLOOMS

4 x 4-inch base

Open-hearth, Pittsburgh	$40.00
Open-hearth, Youngstown	40.00
Open-hearth, Philadelphia	45.17
Bessemer, Pittsburgh	40.00
Bessemer, Youngstown	40.00
Forging, Pittsburgh	45.00
Forging, Philadelphia	50.17

SHEET BARS

Open-hearth, Pittsburgh	$42.50
Open-hearth, Youngstown	42.50
Bessemer, Pittsburgh	42.50
Bessemer, Youngstown	42.50

SLABS

Pittsburgh	$40.00
Youngstown	40.00

WIRE RODS

¼-inch and finer

Wire rods, Pittsburgh $51.00

Standard extras, $2.50 per ton over ¼-inch; $5 for screw stock; $15 for acid wire rods. Carbon extras, $3 for 0.20 to 0.40; $5 for 0.41 to 0.55; $7.50 for 0.56 to 0.75; $10 over 0.75.

SKELP

Grooved skelp, Pittsburgh	2.35c to 2.40c
Universal skelp, Pittsburgh	2.35c to 2.40c
Sheared skelp, Pittsburgh	2.35c to 2.40c

Shapes, Plates and Bars

Prices per pound

Structural shapes, Pittsburgh	2.50c
Structural shapes, Phila.	2.57c to 2.82c
Structural shapes, New York	2.59c to 2.84c
Structural shapes, Chicago	2.60c
Tank plates, Pittsburgh	2.50c
Tank plates, Philadelphia	2.62c to 2.82c
Tank plates, New York	2.64c to 2.84c
Tank plates, Chicago	2.60c
Bars, soft steel, Pittsburgh	2.40c
Bars for cold finishing, Pitts.	2.55c
Bars, soft steel, Philadelphia	2.72c
Bars, soft steel, New York	2.74c
Bars, soft steel, Chicago	2.50c
Bars, refined iron, Pittsburgh	3.25c to 5.00c
Bars, rail steel, Chicago	2.30c to 2.33c
Bars, rail steel, mill	2.10c to 2.20c
Reinforcing bars, billet, Pitts.	2.40c
Bar iron, common, Phila.	2.57c to 2.62c
Bar iron, common, New York	2.59c to 2.64c
Bar iron, common, Chicago	2.40c
Bars, forging quality, Pitts.	2.65c

Hoops, Bands, Shafting

Prices per pound

Hoops, Pittsburgh, under 5 in.	3.00c
Hoops, Pittsburgh, 20 gage, under 1 in.	3.35c to 3.50c
Bands, Pittsburgh	3.00c
Cold finished steel bars, Pittsburgh base	3.00c
Steel shafting, Pittsburgh	3.00c
Cotton ties, bundle 45 lb. Pittsburgh	$1.68

Rails, Track Material

Standard bessemer rails, mill	$43.00
Standard open-hearth rails, mill	43.00
Relaying rails, St. Louis	27.00 to 32.50
Relaying rails, Pittsburgh	30.00 to 34.00
Light rails, 25 to 45, mill	2.15c to 2.25c
Angle bars, Chicago base	2.75c
Spikes, railroad, Pittsburgh	3.05c to 3.15c
Spikes, small railroad, Pitts.	3.35c to 3.50c
Spikes, boat and barge, Pitts.	3.50c
Spikes, railroad, Chicago	3.10c
Track bolts, Pitts. Standard.	4.00c
Track bolts, Pitts., small	4.75c to 5.00c
Track bolts, Chicago	4.10c
Tie plates, Pittsburgh	2.55c to 2.60c
Tie plates, Chicago	2.60c

Spike, tie plate and truck bolt prices for carlots.

Wire Products

To Jobbers in Carloads

Prices per pound

Wire nails, Pittsburgh	3.00c
Galv'd nails, 1-inch and over	5.25c
Plain wire, Pittsburgh	2.75c
Annealed wire, Pittsburgh	2.90c
Galvanized wire, No. 9 gage, Pittsburgh	3.35c
Barbed wire, painted, Pitts.	3.45c
Barbed wire, galv., Pitts.	3.80c
Polished staples, Pittsburgh	3.45c
Galvanized staples, Pittsburgh	3.80c
Coated nails, count keg, Pittsburgh	2.70c
Woven wire fencing (retailers)	65 off
Woven wire fencing (jobbers)	67½ off

Chain, Piling, Strip Steel

Prices per pound

Chain, 1-in. proof coil, Pitts.	6.00c
Sheet piling base, Pittsburgh	2.55c
Hot rolled strip steel, Pittsburg stamping quality	3.00c
Cold rolled strip steel, hard coils, 1½ inches and wider by 0.100-inch and heavier, 0.100-inch and heavier, base	5.00c

Sheets

SHEET MILL BLACK

Prices per pound

No. 28, open-hearth, Pitts.	3.75c to 3.85c
No. 28, bessemer, Pitts.	3.75c to 3.85c
No. 28, open-hearth, Phila.	4.02c to 4.17c
No. 28, open-hearth, Chicago	4.09c to 4.19c

TIN MILL, BLACK

No. 28, open-hearth, Pitts.	3.75c to 3.85c

GALVANIZED

No. 28, open-hearth, Pitts.	4.90c to 5.00c
No. 28 bessemer, Pittsburgh	4.90c to 5.00c
No. 28, open-hearth, Phila.	5.22c to 5.32c
No. 28, open-hearth, Chicago	5.19c to 5.34c

BLUE ANNEALED

No. 10, open hearth, Pitts.	2.90c to 3.00c
No. 10 bessemer, Pittsburgh	2.90c to 3.00c
No. 10, open-hearth, Phila.	3.32c
No. 10, open-hearth, Chicago	3.34c

AUTOMOBILE SHEETS

No. 22 Pittsburgh	5.35c

Tin Plate

Prices per 100-pound box

Tin plate, coke base, Pitts.	$5.50

Iron and Steel Pipe

Base Discounts Pittsburgh to Jobbers in Carloads

	Black	Galv.
1 to 3-inch, butt steel	62	50½
1 to 1½-inch, butt iron	30	13

Boiler Tubes

Less Carload Discounts—Carloads 4 Points Additional

Steel 3¼ to 3¾-inch	38½
Charcoal iron, 3¼ to 4½-inch	5
Seamless hot rolled, 3½ to 3¾-inch	35

Cast Iron Water Pipe

Prices per net ton

Class B Pipe

Four-inch, Chicago	$61.20 to 62.20
Six-inch and over, Chicago	57.20 to 58.20
Four-inch, Birmingham	51.00 to 52.00
Six-inch and over, Birmingham	47.00 to 48.00
Four-inch, New York	65.60 to 66.60
Six-inch and over, New York	60.60 to 61.60

Standard fittings, Birmingham, base, $110.00 6 to 24-inch, base; over 24-inch, plus $20; 4-inch, plus $20; 3-inch, plus $20; gas pipe fittings, $5 higher.

Class A pipe is $5 higher than Class B.

Scrap Advance Is Checked

Demand Holds but Prices Remain Steady or Yield Somewhat—Stocks Increase and Consumers Delay Buying—Dealers Buy for Contracts

SCRAP PRICES, PAGE 446

Chicago, Feb. 5.—Scrap iron and steel prices have recovered from the slight weakness of a few days ago and dealers once more are talking of $20 melting steel in the near future and refusing present offers of $18.50. Inland Steel Co. has purchased about 15,000 tons at a reported $18.50. The Crane Co. has been in the market for short rails but has not yet bought malleable. Blast furnaces still are active seekers of cast borings and short turnings. Rolling mill and foundry grades are quiet. The market here is not what could be called active but dealers have regained some of their courage and with mill operations steadily increasing they are confident that the list will be marked up shortly. Railroad lists include about 7000 tons by the Union Pacific, 4300 tons by the Pennsylvania northwest and southwest regions, 1700 tons by the Chicago, Milwaukee & St. Paul and blind lists by the Michigan Central, Erie and New York Central.

Heavy Melting Quieted

Boston, Feb. 5.—Active trading of the past two weeks in heavy melting steel scrap has subsided and most melting present buying is against old orders which are being filled rapidly. A Bridgeport, Conn., buyer bought a moderate tonnage of heavy melting steel at $16.50 delivered. At Boston the price is close to $15 on cars shipping point. Several eastern Pennsylvania plants have bid for scrap pipe in this market, but in most cases the figures have been too low. One lot was placed at $12.25 on cars Boston. All cast grades are slightly less active with prices barely holding even. Textile scrap is scarce and some sales have been made at $23.50. For the regular run of No. 1 machinery $22.50 delivered is the prevailing figure. Much scrap is coming onto the market through large sales.

New York Prices Higher

New York, Feb. 5.—Considerable activity prevails in iron and steel scrap, with prices on several grades higher. Heavy melting steel, however, remains unchanged, although a strong demand prevails. A feature of the improved inquiry is a better demand for cast scrap and wrought materials. Dealers now are paying $16.50 to $17.50 for city wrought and $17.50 to $18, New York for railroad wrought. Steel car axles and rerolling rails are among the remaining more important items affected.

Midland Interest Buying Again

Pittsburgh, Feb. 5.—A few 1000-ton or 1500-ton lots of heavy melting scrap have been sold by various dealers here to a Midland, Pa., consumer, which with a sale of several thousand tons to a nearby melter constitutes the scrap market activity for the past week. This was done on a $22 basis and since for guaranteed material of the highest grade, $23 would have to be paid, as the last sale was made at that price, the market is described as inactive but strong, the quietness being more or less natural this week, since several railroad lists are closing or will be closed Feb. 6, totaling about 80,000 tons including the New York Central with its various branches, the Pennsylvania and the Baltimore & Ohio. The sale at the Boston navy yard today puts on the market part of the navy's disposal of 12,500 tons, of assorted scrap. These offerings are confidently expected to bring high figures since the market possesses no perceptible marks of weakness and it is reported here that $24 has been paid in the valley for scrap. A Monessen, Pa., consumer is expected to buy large tonnages soon and other buyers such as those located at Brackenridge, Pa., and Weirton, W. Va., will purchase likewise. Rerolling rails cannot be had at less than $23.50 to $24, an advance of 50 cents per ton. Specialties are difficult to locate at less than $25, but the bases of last sales is $24 to $24.50.

Price Advance Is Checked

Cincinnati, Feb. 4.—Sentiment among iron and steel scrap dealers continues bullish and the market holds firm, although the upward movement has paused. Steelmakers with one or two exceptions apparently are covered for the next few weeks and are purchas-

(*Concluded on Page* 399)

Sheet Bar Inquiry Better

Negotiations Underway on 50,000 Tons of Open-Hearth Sheet Bars—Mills Specifying Heavily—Price Situation Steady

SEMIFINISHED STEEL PRICES, PAGE 387

Pittsburgh, Feb. 5.—While specifications on semifinished steel contracts constitute the major portion of market activity in the different products in that category, sheet bars, billets, slabs, etc, occasionally a new inquiry develops which inspires hope for additional business at an early date. Several inquiries, for instance, came out this week for billets in lots of 1000 tons or more at a time; one large inquiry involving about 10,000 tons of sheet bars came from Canton, O., and a large interest is understood to be negotiating quietly for 50,000 tons of open-hearth sheet bars. Efforts to develop lower prices failed and $42.50, Pittsburgh or Youngstown, continues the quotable market on sheet bars, despite the fact that one or two buyers have developed a concession from sellers on a part of the freight and are buying sheet bars at $42.50 delivered to their plants instead of that figure and Pittsburgh basis.

Billets, 4 x 4-inch, are unchanged at $40 and while some makers might furnish the smaller billets and waive the $2.50 differential, the tendency is growing to demand that extra. Slabs are quotably unchanged at $40. The wire rod market is exceedingly quiet, no new inquiries being current here, but the market price is unchanged at $51, base. Some specifications on contracts are received regularly and the fact that practically all conversion mills protected themselves as to their wire rod supply, explains why there is a lack of open market buying. The same condition applies to skelp which still is quoted at 2.35c to 2.40c, base Pittsburgh, although some are endeavoring to maintain a 2.50c. base Pittsburgh level. More forging billets were sold at $45, Pittsburgh, than was at first supposed. Unfilled orders are relatively heavy in this commodity, particularly among the oil well supply people.

Price Remains at $42.50

Youngstown, O., Feb. 5.—An Ohio producer and consumer of sheet bars who last week was seeking 5000 tons of open-hearth material, is understood to have closed on his requirement. One district mill quoted on the tonnage at $42.50, Youngstown, but it is understood the business was placed elsewhere. A shortage of raw open-hearth steel forced one producer of semifinished out of the market early this quarter although tonnage of the bessemer grade continues available. The remaining producer is in a position to entertain sheet bar and slab business but delivery cannot be had until March. The semifinished price remains unchanged at $42.50, Youngstown or Pittsburgh.

Specifying Heavily

Cleveland, Feb. 5.—Consumers of semifinished steel who have contracts are specifying heavily, and new demand is coming out in good volume, though the leading maker in this district is sold up for this quarter, and is not booking further ahead. An inquiry for 5000 tons of sheet bars for quick shipment for a Canton, O., user current last week is reported closed with a maker elsewhere. Several makers who quoted $42.50 Youngstown on the tonnage failed to secure the business.

Billet Sales Small

Philadelphia, Feb. 5.—Billet sales continue restricted to occasional small or moderate tonnages at $40, base Pittsburgh, for rerolling quality, and $45 for forging grade.

Lower Prices

On Ferromanganese Fails to Bring Out Much Tonnage—$106.50 Done

FERROALLOY PRICES, PAGE 387

Pittsburgh, Feb. 5.—Some attractive orders for ferromanganese were accepted by domestic producers last week at $106.50, Baltimore base, after which they commenced to quote a minimum of $107.50. This last figure is likewise the basis of what sales of English material were arranged during the same period, since after going to $109

from their official figure of $110, Atlantic seaboard, duty paid, English sellers took some small orders at $107.50. Current needs to the extent of about 500 tons of various users in Pennsylvania, Ohio and West Virginia territories were met with domestic material. The majority of those buyers not participating in the January buying movement at $109, however, still are deferring action, apparently in the expectation of lower prices. Various reasons are advanced, by sellers, however, for an opposite result, chiefly, the shortage of manganese ore and the disinclination of English makers to sell at a loss. The Scullin Steel Co., the Commonwealth Steel Co., the Wheeling Steel Corp., the National Car Wheel Co., and the Weirton Steel Co., are mentioned as among those recently in the market, some of which have bought.

Some consumers find they have under-estimated their requirements. In some cases March shipments will go forward this month. Other alloys are quiet.

Spiegeleisen is unchanged at $38 to $40, furnace on high grade material, depending upon the quantity wanted, and at $37 to $39, for the 16 to 19 per cent grade.

Several Thousand Tons Sold

New York, Feb. 5.—Several thousand tons of ferromanganese have been sold during the past week at $107.50 duty paid tidewater. This price now indicates the market. The reduction has failed to bring out as much business as was expected.

Several hundred tons of spiegeleisen have been sold during the past week. The market on spiegeleisen continues $38 to $40 furnace for the 20 per cent grade. Further small business has been done in English spiegeleisen but the amount of tonnage involved is not sufficient to have much of a bearing on the market. Such English as is being sold is bringing prices which are competitive with the delivered quotations on domestic spiegeleisen.

Business in ferrovanadium in January was larger than for any month since 1920, due to large buying for automotive account. The price of ferrovanadium is unchanged at $3.50 to $4 a pound contained. Other alloy quotations are unchanged with the markets dull.

New Inquiries Lacking

Philadelphia, Feb. 5.—Several thousand tons of ferromanganese both English and domestic was sold to this territory the past week largely at $107.50, duty paid tidewater, with some of it going at $106.50. The market now is quoted at $107.50, tidewater, but this largely is nominal because recent reductions have had the effect of discouraging buying. Practically no inquiries now are current.

Chicago Operations Sane

Chicago, Feb. 5.—General operations of the Illinois Steel Co. continue at 93 per cent of capacity and the company has 22 out of 27 steel works blast furnace stacks active. General operations of Inland Steel Co. are unchanged at 75 per cent, which on this basis approximates capacity.

Furnace Coke More Active

Steelworks Interest Closes on Tonnage Below $4.25—Another Seeking 15,000 Tons Monthly—Coal Strike Threat Discounted

COKE PRICES, PAGE 387

Pittsburgh, Feb. 5.—Blast furnace operators are stirring up more interest in beehive coke. The Shenango Furnace Co. has closed on a portion of its requirements, it is understood, below $4.25. The company will shortly put on another furnace. Another steelworks furnace is inquiring for 15,000 tons monthly. One or two smaller ones also are inquiring. Many coke producers are naming $4.50 to $4.75 on extended shipments. The trade generally is less inclined to anticipate a coal strike. Although a short suspension of activity at union mines is expected, it is believed it will not be measurable in affecting the Connellsville district. Spot sales involving around 25 carloads are booked from time to time. These usually carry $4 or $4.15 prices, although some are sold at $3.75. These prices on small lots still are obtainable in one or two directions. A price of $4.15 was applied on one sale this week under 1000 tons. Foundry coke activity still is limited to a fair number of small spot inquiries and an occasional larger inquiry. A typical sale is that of the General Electric Co., closing on 500 tons each for Schenectady and Erie plants and 280 tons for Bayway, N. J., at around $5.50. Some foundry coke still is available at $4.75 and $5. The usual contract figures are $5.25 to $5.50. Premium brands are commanding as high as $6.50. Heating coke is selling in small lots at $3.25 to $3.40.

Production, according to the *Connellsville Courier* for the week ended Jan. 26 was 208,960 tons as compared with 204,510 tons the preceding week.

Eastern Demand Is Steady

New York, Feb. 5.—While coke demand is not large, it is steady. Current buying is confined entirely to spot and nearby shipment. The market on standard beehive foundry coke is $5 to $5.50, Connellsville, while as high as $6.50 and $7 are being obtained for special brands. Prices on medium sulphur coke are somewhat higher, this grade now bringing $3.50 to $3.75, Connellsville. By-product foundry coke is bringing $10.91, delivered at Newark and other Northern New Jersey consuming points.

Furnaces Delay Purchases

Cincinnati, Feb. 5.—Blast furnace coke buyers continue to mark time and the belief is current that no more contracts will be written until next month. Users generally who must buy will purchase in the spot market. The Low Moor Iron Co., Low Moor, Va., is reported to have contracted for 4000 tons of furnace coke for shipment this month and in March. This represents the most important transaction recorded here in two weeks. Foundry coke sales continue the outstanding feature. Several Connellsville sellers have advanced their prices 25 cents a ton. The minimum is $5.25, although some of the special brands bring as high as $6.50. Wise county foundry coke is in fair demand and the same is true of the New River grade.

Western Melters Inquiring

St. Louis, Feb. 5.—Producers report better orders from dealers, but purchasing by consumers continues on a hand-to-mouth basis, there being little disposition to accumulate. Foundry coke is quiet because contracts for future requirements have been placed and most of the plants are well supplied for current needs. Some improvement in the demand from western melters has developed during the past two weeks. The threat of a coal strike has stimulated inquiries. Local by-product producers continue to quote $12.50, ovens, for foundry coke, and $8.50 to $10 for the domestic grade.

Southern Market Quiet

Birmingham, Ala., Feb. 4.—Despite activity in the pig iron market, the coke market in the Birmingham district is showing little improvement. By-product foundry coke is bringing $6 to $6.50, though one interest is quoting $5.50. Furnace companies are keeping a good supply of coke on hand in anticipation of steady operations for an indefinite period. Production as a whole in Alabama has not increased in the past three months.

Buying Good

In Tin Plate With 100,000 Box Order Placed—Mills Run High

TIN PLATE PRICES, PAGE 387

Pittsburgh, Feb. 5.—The fact that the average operating rate of the tin plate industry is between 90 and 95 per cent demonstrates the fact that there has been no letup in specifications nor in the buying rate. Some plants are operating at 97 per cent while one or two are operating full. Practically all specifications are in for March shipment and April specifications are due Feb. 15. Some large canmakers have indicated their intention of sending in April specifications within the next week or two. Several thousand base boxes have been ordered from large producers for shipment to South America at higher prices than could be obtained in the direct export market a month ago, indicating improvement in that direction to the extent of 12 to 22 cents per base box. Competition still is keen on re-export material but the domestic price is unchanged at $5.50 per base box, 100 pounds, Pittsburgh. The Texas Co. has been inquiring for 100,000 base boxes of tin plate for shipment in April, May and June.

Large Order Is Placed

New York, Feb. 5.—The Texas company which inquired for 100,000 boxes of tin plate last week is understood to have placed this business.

Bar Users Need Tonnage

Mills at Chicago Falling Behind on Delivery While Buying Continues to Exceed Production—Much Buying in Small Lots—Cold Finishers Active

BAR PRICES, PAGE 387

Chicago, Feb. 5.—Makers of soft steel bars continue to book in excess of shipments. Demand is from wide sources, improvement in the farm implement industry and the spurt in the automotive industry being most important. Railroad car builders still are large factors, one inquiry calling for protection on 25,000 tons of finished material. Deliveries necessarily are slowing up, although tonnage is being distributed to avoid disturbance of manufacturing schedules. The soft steel bar price is 2.50c, Chicago.

Rail steel bars continue to increase in demand. One maker is on two turns but others adhere to one turn. Seasonal demand for bars for fence posts is a factor. Demand for rail steel and iron bars probably will pick up as soft steel bar deliveries fall back. In bar iron no improvement is noted, and one turn is the best that can be done. The rail steel bar quotation is 2.30c, mill, or 2.30 to 2.33c, Chicago, while bar iron is 2.40c, Chicago.

Buying Still Is Spotty

Philadelphia, Feb. 5.—Steel bar buying is spotty but the average is good. January sales doubled those of December. February so far shows further improvement. The price on the general run of business is firm at 2.40c, Pittsburgh, and exceptions to this price are rare.

Bar Sales Doubled

Boston, Feb. 5.—Heavy bar sales during the past week are reported by the leading sellers the total tonnage placed being double that of the previous week. Drop forge plants constitute one of the chief outlets. Wire and wire products manufacturers have been buying heavily. The price is firm at 2.40c Pittsburgh.

Most Receive Large Tonnages

Pittsburgh, Feb. 5.—While some dissatisfaction is expressed over present buying of merchant steel bars, most producers are receiving pleasing specifications and are operating at around 80 per cent. Many of these orders are for small tonnages but they are repeated sufficiently often to make the aggregate large. Jobber specifications in single carloads up to three carloads are coming to makers here and in the Youngstown district. The cold-drawn industry keeps bar makers well supplied with specifications since calls by the automotive and other industries still are heavy. Changes in the refined iron bar market are not well defined from week to week. Producers claim there is a steady trend toward improvement and prices are firm at 3.25c to 5.00c, base Pittsburgh.

New Orders Keeping Up

Cleveland, Feb. 5.—New business in steel bars is keeping up nicely in this territory and all local mill offices report the best tonnage in months. With some of them the total of new business passed to the mills in January was the largest in over a year. Buyers are running close on their requirements and are not dipsosed to order tonnage very far in the future but their position is becoming more difficult since the mills are filling up and deliveries are stretching out. On large sizes of bars these are now given as four to six weeks and on small sizes from three to four weeks. Prices are firm at 2.40c, Pittsburgh except to the larger manufacturing trade which is receiving accustomed concessions from regular sources of supply. Hoop and band prices are steadier.

Cold Drawn Demand Wide

Pittsburgh, Feb. 5.—That diversified lines of consumption are active is typified by the varied specifications being received by finishers of cold-drawn steel bars. Last week, orders came in from practically every customer on the books of representative makers. Commitments carry producers well through first quarter, though a little room is left. Shipments are heavy, January's being double those of December. The price is firm at 3.00c, base Pittsburgh, although the 3.00c, Chicago price named by the large finisher there is being met in competitive territory.

Narrow Hoops in Demand

HOOP PRICES, PAGE 387

Pittsburgh, Feb. 5.—Narrow sizes of hoops and bands are in demand as compared with regular hot strips. Some makers state their smaller mills are fully scheduled for the rest of first quarter, while their larger hot strip mills lack business to the end of March. Much demand originates in the automotive industries, although other lines of activity are active. Prices are firm at 3.00c, base Pittsburgh, with regular differentials applying on narrow hoops of thin gages. On some of the latter 3.25c to 3.35c, base Pittsburgh has to be obtained because of the limited production obtainable.

Warehouse Trade Picks Up

WAREHOUSE PRICES, PAGE 442

Detroit, Feb. 5.—Movement of bars and bands in warehouse circles is broadening, buying from smaller consumers in other parts of the state being marked in the past 10 days. Movement of sheets also is broader than it has been for months. This is true especially of galvanized sheets, indicating buying in anticipation of an active building season when weather will permit. Speculators in galvanized sheets are said to have unloaded most of their wares before the end of last year. As a result there is a stronger tendency in values. Mill shipments are becoming more deferred on this grade of material as well as on bars and bands. There is no change in prices.

Active Demand Continues

New York, Feb. 5.—An active demand continues for iron and steel products out of warehouse, shapes and reinforcing bars moving in particularly good quantity. The expected price advance in galvanized sheets has not as yet materialized, but is likely to develop shortly.

Buying Picking Up

Cleveland, Feb. 5.—February trading in iron and steel products from warehouses indicates an increased tonnage of business placed over that in January. Buying is mostly in small lots although a few manufacturers are buying ahead for spring needs. Prices are firmer with less tendency to shade being noted in all grades.

Sales Now 70 Per Cent of Normal

Philadelphia, Feb. 5.—Iron and steel sales by jobbers in this district increased during the past week to about 70 per cent of normal. Prices are firm but unchanged.

Bolt, Nut, Rivet Prices Are Advanced

NUT AND BOLT PRICES, PAGE 444

Pittsburgh, Feb. 5.—Advances in nuts and bolts recently inaugurated are the result of a general firming up of price policies of makers, amounting to about 5 per cent. Large machine bolts are quoted at 60 and 5 off instead of 60 and 10 off and the advance is coincident with a general improvement in the buying rate which makes for bettered operations. The average now is nearer 75 per cent of capacity than it has been in many weeks.

Several carload orders for rivets have been received and while it is difficult to locate the 2.75c, base price, it has not entirely disappeared. Small rivets are quoted at 65 and 10 off instead of 65, 10 and 5 off.

Intermittent demand for washers is noted; mainly from jobbers in carloads which still are obtainable at $5.50 off list. On smaller quantities some makers will quote nothing less than $5 to $5.25 off list.

Bolt Prices Advanced

Philadelphia, Feb. 5.—Eastern bolt makers have advanced prices on large machine bolts, and hot pressed nuts to 60 and 5 off from 60 and 10 off, the preceding level. Other grades have been advanced similarly. Rivets continue to be quoted at 2.90c, base Pittsburgh, but that price is weak, as low as 2.75c, Pittsburgh having been done in some instances.

Prices Are Higher

Cleveland, Feb. 5.—Local bolt and nut producers have advanced quotations approximately 5 per cent in line with makers in other districts. The higher prices are the direct result of improving demand and mounting production costs. Large orders are not numerous but the volume of small business being taken totals a large amount. Operations at most plants are at a good rate.

Makers Enjoy Better Business

Chicago, Feb. 5.—Bolt and nut makers continue to quote 60 and 5 off, the base for large machine bolts, upon small or unattractive business but the going quotation for larger lots still is 60 and 10 off. Business continues to

flow in and those makers who were not so comfortably situated a short time ago now are enjoying better business. High operations in the automobile and implement industries are largely responsible for the good demand.

Furnace Operators Study Coal Problem

Naming of a committee to shape up all the highly important data gained by the Southern Ohio Pig Iron and Coke association bearing upon the problem of classifying and obtaining good gas-producer, steam and coking coal from producing mines was one of the most important results of the meeting held uesday, Jan. 29 at the Gibson hotel, Cincinnati. Meeting with the Southern Ohio association, when in the afternoon it was called to order by President R. H. Sweetser, were members of the Ohio section of the American Institute of Mining and Metallurgy and of the Cincinnati coal exchange.

Following a discussion on the evaluation of coal, a committee was named with instructions to consider separately phases of evaluation, the entire committee to report finally at the next meeting of the association. This committee consists of W. W. Stevenson, L. R. Forrest, J. H. Briscoe, Prof. Dana J. Demorest, C. B. Murray, Thomas DeVenny and George M. Coughlin.

Because the Ohio industrial commission's actuaries now are at work on a proposed revision of rates for industrial compensation in that state, report to be made by July 1, a committee was named to consult with the state authorities on behalf of the association. This committee consists of C. E. Lewars, Leon Ehrman, Noah G. Spangler and W. M. Jeffreys.

Thomas Plant Is Sold

Youngstown, Feb. 5.—An agreement has been arranged for the sale of the Thomas plant of the Youngstown Sheet & Tube Co., Niles, O. to W. A. and C. S. Thomas. This plant which was acquired by the Youngstown Sheet & Tube Co. when it absorbed the Brier Hill Steel Co., has not been operated by the former owner. It consists of 12 sheet mills and six galvanizing pots. W. A. Thomas was president of the former Brier Hill Steel Co. and C. S. Thomas was president of the former De Forrest Sheet & Tin Plate Co. While the plans of the new owners have not been announced, it is expected they will put the plant in operation at an early date. This is the second sale of sheet mill property negotiated by the Youngstown Sheet & Tube Co. within a week, it having transferred its Empire works also at Niles to Jacob D. Waddell. It is reported the company also has negotiations under way to dispose of its Western Reserve plant at Warren, O., consisting of six sheet and two jobbing plate mills.

Carnegie Adds Stacks

Pittsburgh, Feb. 5.—The two Lucy stacks of the Carnegie Steel Co., now are in blast giving it 47 out of 59 active. Its steelmaking operations likewise have been increased to 92 per cent of ingot capactiy, the highest in many weeks.

Plate Business Holding Up

Mill Capacity Well Engaged With Moderate Size Orders—Oil Tanks Again Factor—Good Pipe Contracts Awarded

PLATE PRICES, PAGE 387

New York, Feb. 5.—Bethlehem Steel Co. will furnish about 3000 tons of plates for the riveted pipe line to be built on Staten Island for the New York department of water supply. The Peter F. Connolly Co., Cleveland, has the general contract for this job, and the Staten Island Shipbuilding Co. will fabricate the pipe. The T. A. Gillespie Co. has the contract for a pipe line at Boston, and the plates, about 1600 tons, will be furnished by the Carnegie Steel Co. There continues steady buying of plates for current shipment but the volume of this business is somewhat smaller than a week or two ago. Prices are unchanged, ranging from 2.35c to 2.40c, Pittsburgh, on attractive lots, with occasionally 2.30c in exceptional instances.

The New York Central Railroad Co. will open bids Feb. 8 on five steel car floats and two new tugs. The car floats are to have capacity for 16 cars each.

Pipe Takes 1000 Tons

Boston, Feb. 5.—Plate sales at 2.35c have been made during the past week, and there are rumors of some transactions below this level. Demand, however, has improved. The commonwealth of Massachusetts has placed 1600 tons for a 5-foot pipe line between Waltham and Weston. The general contract for this work went to the T. A. Gillespie Co. and the steel pipe to the East Jersey Pipe Co.

Bookings About 40 Per Cent

Philadelphia, Feb. 5.—Plate demand is spotty with not sufficiently large bookings to raise the average of eastern operations above from 40 to 50 per cent. Prices continue from 2.30c to 2.40c, Pittsburgh.

Fabrication Inquiries Few

Pittsburgh, Feb. 5.—Inquiries for plates coming to fabricators here are few and far between, although the mills are able to report fairly heavy bookings so that capacity is well engaged. Some mills are operating 80 or 90 per cent. The barge inquiry from Florence, Ala., calls for six or eight barges but in any event no more than 1000 tons of plates is involved. A few gas holder inquiries still are pending involving between 2000 and 5000 tons. Other inquiries involving plates call for a standpipe at one point, a water tank at another or an oil tank somewhere else, usually 100 to 300 tons of plates. For instance a standpipe is wanted in McKeesport, Pa., one 80,000-barrel tank is wanted by an oil company in New England. Small inquiries appear spasmodically from boiler shops and occasionally a large tonnage comes out from a carbuilder. Most of these, however, simply issue specifications to apply on their contracts. Plates here are firm at 2.50c, base Pittsburgh.

Good Business Is Moving

Cleveland, Feb. 5.—The movement of new plate tonnage is holding up well especially in carloads up to moderate tonnages as the market at present is not featured by any large requirements. Some protections against pending shipyard business still are outstanding. Oil field demands have shown some increase. The Henry Vogt Machine Co., Louisville, Ky., has taken 15 stills with the Atlantic Refining Co. requiring about 3000 tons. The D. Connelly Boiler Co., Cleveland, has taken four high pressure boilers for Los Angeles requiring 250 to 300 tons. An inquiry for 12 boilers from the Carnegie Steel Co. is current. Several thousand tons of plates are scheduled to be closed soon for locomotives for the New York Central railroad. The open market remains 2.50c, Pittsburgh, and concessions from that figure except those usually granted to the largest consumers are diminishing.

Oil Tanks Again Factor

Chicago, Feb. 5.—Six thousand tons of plates for conversion into oil storage tanks for San Pedro, Cal., are needed by a Chicago district tank interest. Inquiry also is out for plates for a number of small oil storage tanks. A Japanese shipyard is in the market for 7300 tons of ship plates but freight rates to the Coast militate against this business coming to Chicago. Freight car builders continue to protect themselves on a large tonnage.

Better Wire Demand

Improvement Taking Form and New Business Satisfies Producers

WIRE PRICES, PAGE 387

Pittsburgh, Feb. 5.—Improvement in wire products gradually is taking form and while there still is room for more, producers are vastly more encouraged than they were in December. Considerable impetus has been given to the fencing business and jobbers are filling up to meet the spring demands; mixed carload orders are numerous. The nail demand continues particularly heavy. Some buying ahead is being done, several makers receiving orders for shipment over the remainder of this month and some already being well committed for March. Operations of nail and wire will undoubtedly average near 75 per cent of capacity. Prices are firm at 2.75c and 3.00c, base Pittsburgh for plain wire and wire nails, respectively.

Demand Is Better

New York, Feb. 5.—Improvement in wire and nail demand, though less pronounced, continues to be reflected in current bookings which still exceed shipments. The wire and nail industry generally is operating at close to 80 per cent of capacity and this ratio is expected to increase further. Prices are firm at 2.75c base Pittsburgh for wire and 3.00c base Pittsburgh for nails.

New Business Satisfactory

Chicago, Feb. 5.—Bookings by makers of wire and wire products are not spectacular but are in good volume. Demand seems well spread over the entire range of products. Prices are firm and operations are unchanged.

Concrete Market Cheerful

End of Present Lull in Demand Seen as Larger Projects Are Brought Out for Figures—Inquiry Grows Daily

REINFORCING BAR PRICES, PAGE 387

Cleveland, Feb. 5.—Few projects calling for more than 30 to 60 tons apiece are being brought into the concrete reinforcing bar market for figures. Larger projects are in sight but are not yet active. Most of the prospective business is in the southern part of the state and in Kentucky. Especially active are building programs in Cincinnati and Louisville, Ky. The Queen City club and a building for a fraternal organization are planned for Cincinnati, as well as several office buildings which now are pending. Little shading of the 2.75c, Pittsburgh, price of reinforcing bars out of stock is noted. On new steel bars, 2.40c, Pittsburgh, still is the market figure for business in the southern part of the state, although 2.30c, Pittsburgh, is a common quotation in the Cleveland district. Bars rolled from rail steel continue to be quoted at 2.10c, mill on what little business is up. Grade crossing work for the Pennsylvania railroad, involving six or seven street bridges will require a tonnage of reinforcing bars. Plans for this work will be out in several weeks. H. E. Culbertson, Hanna building, is engineer.

Price Revision Expected

Pittsburgh, Feb. 5.—Reinforcing concrete bar awards are at the lowest point in several months. All sellers report receipt of a fair number of small 5 to 25-ton jobs, but for this past week none above that is reported. Before the present week is out some large lots will have been placed, since the Kaufman & Baer Co. warehouse inquiry is out again and other projects are reaching the closing point. As originally figured this warehouse would require 700 or 800 tons but design changes reduces the amount to about 500 tons. Several other jobs requiring 100 to 200 tons apiece are being figured. Some sellers state they will have to revise their 2.65c quotation to 2.90c, base Pittsburgh. The mill price on new steel bars is unchanged at 2.40c, base Pittsburgh.

Fewer Inquiries Active

Cincinnati, Feb. 5.—Activity in the reinforcing concrete bar market is not as pronounced as it was a week ago. Much business is being delayed. A few small awards are noted, but no large tonnage is involved and even the aggregate tonnage is but fair. Considerable tonnages of reinforcing bars continue to go into state and county roadwork. A few inquiries are before the trade involving 50 to 100 tons. One new project is the addition to Markel Bros. plant at Canal and Jackson streets, involving several hundred tons. This will be ready for bids Feb. 11.

Business Still Prospective

Chicago, Feb. 5.—Business in reinforcing concrete bars in the Chicago district continues more in the prospective than in the placed class. Estimating departments still are rushed and most selling interests have figures out on a large aggregate, but actual placements still come slowly. Warehouses are certain that healthy buying is in prospect. Recent weakness in reinforcing bars appears to be disappearing and the most general quotation is 3.00c, Chicago warehouse.

CONCRETE CONTRACTS PLACED

Awards this week ..... **2,750 tons**
Awards last week ..... **1,200 tons**
Awards two weeks ago ..... **2,725 tons**

1200 tons, Peabody hotel, Memphis, Tenn., to Laclede Steel Co.
650 tons, bridge at Perth Amboy, N. J., to Igoe Bros.
275 tons, Monon railroad freight house, Indianapolis, to Corrugated Bar Co.
200 tons, Concordia Silk Mill, Philadelphia, bought from stock by Turner Construction Co., general contractor.
175 tons, Wayne medical building, Ft. Wayne, Ind., to Hugh J. Baker Co.
150 tons, two stores, Eighth and Market streets, San Francisco, to Gunn, Carle & Co.
100 tons, several school buildings in Ohio territory, to Concrete Steel Co.

CONCRETE CONTRACTS PENDING

1500 tons, sewer in Brooklyn, N. Y.; Mecaro Co., general contractor.
750 tons, building for Standard Sanitary Mfg. Co., Louisville Ky.; plans out. Bids in Feb. 16.
350 tons, Pacific Portland Cement Co. plant, Redwood City, Cal.; bids being received.
300 to 400 tons, building for Merkel Bros., Cincinnati; bids close Feb. 11.
300 tons, stadium for University of Kentucky, Lexington, Ky.; pending.
150 tons, addition to Williamsport bank, Williamsport, Pa.; Frank G. Stewart, general contractor.
150 tons, hotel at Palo Alto, Cal.; bids in.
135 tons, building for Sheridan Trust & Savings bank, Chicago; bids in.
Tonnage not stated, 4-story service building for Ohio State university, Columbus, O.; pending.
Tonnage not stated, building for Duro Pump & Mfg. Co., Dayton, O.; Schenck & Williams, Mutual Home building, architect.
Tonnage not stated, grade crossing elimination work for Pennsylvania railroad, Cleveland; H. E. Culbertson Co., engineer. Plans out in several weeks.

Pipe Mills

Continue To Meet Heavy Demand—Cast Inquiries Are Fewer

PIPE PRICES, PAGE 387 AND 444

Pittsburgh, Feb. 5.—Standard full weight merchant pipe still is in heavy demand and requests for oil country goods are increasing in number and individual orders are larger in size. Deliveries of buttweld sizes of standard full weight merchant pipe are not long deferred, it being possible to obtain shipping notices on most sizes within four to six weeks after receipt of order by the mill. The situation as regards oil country goods is tightening somewhat, although most sizes of lapweld can be had within three or four weeks, although that delivery situation cannot long remain. Numerous jobbers are ordering one, two or three carloads at a time and send in repeat orders often within the week. Operations are about 90 per cent on the average with some plants operating nearly full. Prices are firm on the April, 1923, basis.

Not much improvement is noted in demand for locomotive boiler tubes and even the stationary engine industry is quiet insofar as orders for this type of tubular goods is concerned. Seamless tubing in sizes utilized by the automotive industry is active. Prices obtained show that slight concession is made from the official market levels, although the trend is toward a firmer stand.

Price Strength Tested

New York, Feb. 5.—Opening of bids by the city water department recently on about 11,700 tons reflected considerable strength in prices. On one lot of 3600 tons of 4 to 36-inch pipe, the Warren Foundry & Pipe Co. was low with a bid of $62.95, with United States Cast Iron Pipe & Foundry Co. second, with a bid of $63.90, delivered city yards. On a lot of 6 to 20-inch pipe, amounting to 4140 tons, the United States Cast Iron Pipe & Foundry Co. was the only bidder, with a figure of $62.90, and on 2780 tons of 4 to 12-inch, was second low with a bid of $63.90, or 10 cents a ton higher than John Fox & Co., the low bidder.

R. D. Wood & Co. was low on 1190 tons of 6 to 36-inch pipe, with a bid of $62.62, while the United States Cast Iron Pipe & Foundry Co. was next with a bid of $63.90. This latter company was low on 234 tons of fittings, its bid being $157.90, and was second low on 152 tons, with a bid of $160, as compared with the low bid of $155 as submitted by John Fox & Co. Announcement of the awards is expected shortly.

The city water department has just issued specifications on about 100 tons of 8 to 12-inch high pressure pipe for Coney Island, and is expected to bring out a substantial tonnage of 16-inch pipe for the same project shortly.

Prices Becoming Firmer

Chicago, Feb. 5.—Makers of cast iron pipe still are able to accommodate large-size business for the first half but on smaller sizes their quotations are becoming firmer as the amount of available capacity diminishes. The 4-inch pipe quotation is unchanged as yet at $61.20 to $62.20, Chicago. The United States Cast Iron Pipe & Foundry Co. and the American Cast Iron Pipe Co. have divided the 2650 tons at Milwaukee. Bids are in at Fort Wayne, Ind., on 300 tons and at Chicago on 675 tons. Utilities still are fair buyers of pipe.

Future Activity Assured

Birmingham, Ala., Feb. 4.—Cast iron pipe lettings being received in the Birmingham district assure capacity activity of local plants for several months. There is no surplus stock noticeable here, shipment being almost equal to production. Pressure pipe business has been fairly good this winter and delivery problems of the spring should not be difficult to overcome.

CAST IRON PIPE PLACED

2650 tons, Milwaukee, awarded as follows: 1450 tons to United States Cast Iron Pipe & Foundry Co. and American Cast Iron Pipe Co.
1400 tons, South Bend, Ind., to Lynchburg Foundry Co.
923 tons, work for San Francisco; to American Cast Iron Pipe Co.
701 tons, Sheboygan, Wis., to American Cast Iron Pipe Co.

537 tons, work in St. Paul, Minn., to American Cast Iron Pipe Co.
340 tons, 6-inch class B pipe for Spokane, Wash., to United States Cast Iron Pipe & Foundry Co.
333 tons, North College Hill, O., to American Cast Iron Pipe Co.

CAST IRON PIPE PENDING

7361 tons, 4 to 24-inch class B pipe for Santa Monica, Cal., opening of bids postponed until Feb. 7.
1655 tons, 42-inch pipe for Hetch Hetchy project, San Francisco; bids close Feb. 20.
321 tons, 4 to 16-inch class B pipe for Alhambra, Cal.; bids in.
100 tons, 8 to 12-inch high pressure pipe for Coney Island project for New York wated department; bids asked. Substantial tonnage of 16-inch pipe expected out shortly.

Orders Are Heavier

From Users of Refractories—Chrome and Magnesite Advanced

Pittsburgh, Feb. 5.—Larger individual orders in greater quantities are being received by representative fire clay and silica brick manufacturers, this business improving following the betterment in the steel industry. Kiln operations among the brickmakers average between 75 and 80 per cent, some operating full; others around 65 or 70 per cent, but all are confident that by March 1 they will all be operating at above 90 per cent.

Numerous orders for both fire clay and silica involving 50,000 to 100,000 brick at a time are noted interspersed with several for 200,000 to 500,000 and one or two larger ones have been taken this past week. The majority are for repair purposes, although some new construction items now are up for consideration. The Trumbull-Cliffs Furnace Co., ordered a new blast furnace lining recently. The linings for new blast furnaces contemplated will represent a large volume of brick business and will be closed shortly, such as the American Radiator Co., the Ford Motor Co., the Youngstown Sheet & Tube Co., the Toledo Furnace Co., and the Central Steel Co.

On Feb. 1 chrome and magnesite brick was advanced $2 per net ton, returning to the levels prevailing several weeks ago, $47 and $65, respectively.

Refractories

FIRE CLAY BRICK
(Per 1000 f.o.b. works)

Pennsylvania, No. 1	$42.00 to 45.00
Pennsylvania, No. 2	35.00 to 38.00
Ohio, No. 1	42.00 to 45.00
Ohio, No. 2	35.00 to 38.00
Illinois, No. 1	45.00 to 48.00
Illinois, No. 2	42.00 to 44.00
Kentucky, No. 1	42.00 to 44.00
Kentucky, No. 2	37.00 to 39.00
Missouri, No. 1	38.00 to 40.00
Missouri, high grade	48.00 to 50.00
Maryland, No. 1	44.00 to 51.00
Maryland, No. 2	40.00 to 42.00

SILICA BRICK

Pennsylvania	40.00 to 42.00
Chicago	49.00
Birmingham	50.00

MAGNESITE BRICK
(Per Net Ton Seaboard Base)

9 x 4½ x 2½	$65.00

CHROME BRICK
(Per Net Ton)

9 x 4½ x 2½	$47.00

Need More Sheet Tonnage

Demand Since First of Year Not So Active as Anticipated—Mills Booked Through February—Scarcity of High-Grade Material Feared

SHEET PRICES, PAGE 387

Pittsburgh, Feb. 5.—Because for the time being order receipts in sheets are greater than either production or shipments in the cases of a few producers, backlogs are being accumulated and it soon will be possible to increase operating schedules. The general average operation among independent operators is above 80 per cent, around 83 per cent, so that the general average for the entire industry is approximately 80 per cent. Many buyers of automobile sheets are not placing contracts but continue to file actual orders every day or so, distributing them among several different producers. Various units of the General Motors Corp. have participated in this character of activity. Auto parts makers in different localities likewise have placed attractive tonnages. Blue annealed sheet orders lately have become more numerous and practically all output for the first quarter now is obligated. Lately some of the producers of small bolted tanks have ordered several hundred tons at a time; more are expected when oil well drilling gets under way in earnest. Carbuilders have commenced to order galvanized sheets for car roofs. The stove and range, metal lath and other manufacturers utilizing sheets in their activity have ordered in fairly large amounts and even agricultural implement makers have furnished a fair quota of the orders received. In fact almost every sheet consuming line is busy and this is reflected in the sheet orders placed each day, amounting to several thousand tons daily on the average. Price concessions continue to be made in two or more directions but so far as can be ascertained these do not exceed $2 per ton, making the range on black 3.75c to 3.85c, base Pittsburgh; blue annealed 2.90c to 3.00c, base Pittsburgh and galvanized, 4.90c to 5.00c, base Pittsburgh. Automobile sheets continue firm at the 5.35c, base Pittsburgh level.

Eastern Market Fairly Active

New York, Feb. 5.—Demand for sheets is fair, although not as large as a couple of weeks ago. The price on blue annealed sheets continues firm at 3.00c, base Pittsburgh, equivalent to 3.32c, delivered New York. Black sheets continue to range from 3.70c to 3.85c, Pittsburgh. On galvanized sheets the usual price is 5.00c, Pittsburgh, although 4.90c has been done during the past week.

Book for Second Quarter Soon

Chicago, Feb. 5—Second-quarter books on steel sheets will be opened shortly by local makers and every indication points to rapid and easy placements. First quarter prices of 3.00c, Pittsburgh, for blue annealed, 3.85c for black and 5.00c for galvanized are expected to obtain. Specifications for sheets of all classifications are heavy. Mills have all of their capacity for the first quarter filled, although doubtless emergency orders could be filled. Some small Japanese sheet inquiry continues to come out but none has been taken. Most of the Japanese business booked last quarter has been worked off.

Mills Need More Tonnage

Youngstown, O., Feb. 5.—Indications are that district sheet producers will experience no difficulty in finishing out this month at the current rate of operations, namely 90 per cent. The majority of order books are well balanced for two weeks ahead and a number of mills are beginning to line up sufficient tonnage to schedule for the last week of this month. While the volume of business is not large, the aggregate tonnage represented is satisfactory particularly for this time in the quarter. Demand for roofing material is being renewed, especially from southern consumers who are increasing their requirements. Stove manufacturers, jobbers and metal furniture producers are supporting the market in a more substantial way. The rate at which sheet tonnage has been placed since the beginning of the year, however, has fallen short of anticipation, and this has given rise to the opinion that a larger volume of business will have to come out it prices for second quarter are to be stabilized. Meanwhile current sheet prices are tending to crystallize at the full market level. While 3.75c for black and 4.90c for galvanized have not disappeared entirely in certain districts, it is plain that the number of producers meeting these prices gradually is decreasing. High-grade sheet producers are well obligated and the most favorable delivery now to be had extends to the middle of March. Many large consumers of this grade of sheets are slow in making their future requirements known and some observers expect to see a shortage. A firm market is apparent throughout this district with blue annealed being quoted at 3.00c, black at 3.85c, galvanized at 5.00c and automobile sheets at 5.35c for No. 22 gage, base Pittsburgh.

Eastern Demand Fair

Philadelphia, Feb. 5.—The sheet market is unchanged, blue annealed being firm at 3.00c, Pittsburgh, equivalent to 3.32c, delivered Philadelphia. Black sheets are quotable at 3.70c to 3.85c, Pittsburgh, and galvanized at 4.90c to 5.00c, Pittsburgh. Makers report a fair demand.

Shows Good Surplus

Youngstown, Feb. 5.—The Trumbull Steel Co. at its annual meeting this afternoon re-elected the board of directors and officers. The company reported earnings of more than $5 per share and added $2,000,000 to the surplus.

Gamsu Sheet Metal Works, New York, has increased its capital stock from $5000 to $25,000.

Shape Activity Increases

Market Strengthens—Foreign Competition Felt in Atlantic Seaboard Markets—Argentine Wants 10,000 Tons for Bridges

STRUCTURAL SHAPE PRICES, PAGE 387

New York, Feb. 5.—Trading in structural steel last week was restricted, although the undertone of the market was good. Fabricators generally regard the present lull as temporary, and as a natural development in view of the heavy activity extending over the greater part of last month. At that time there was a rush to cover before a pending advance in the fabricated material prices, many jobs coming out on a pound price basis. The structural market at present is somewhat unsettled. Some of the weaker shops still can take business for delivery within three months and until they are better booked, a greater uniformity of fabricated material prices is not likely to develop. Plain material prices are firm with lower concessions of the 2.50c, Pittsburgh, price being noted.

According to figures just compiled by a leading fabricator, structural bookings in the New York metropolitan district the past year, exclusive of such work as bridges, tunnels, shafts, etc., amounted to 449,961 tons, this showing being fully 50 per cent greater than reported for any previous year.

Ironworkers in the northern New Jersey district have been granted an increase of 50 cents a day, making the total now $10.50. This advance, which is a compromise between the trade organization of that section and the employers, follows a similar but voluntary action recently by the fabricators, affecting ironworkers in New York, who work on the open shop basis. In both cases, the advance was effective Feb. 1 with the scale to extend over a period of two years.

Large Tonnages Pending

Boston, Feb. 5.—Building awards for January showed a decidedly low total but fabricators still are working on old orders. The amount of new work developing gives assurance of activity throughout 1924. In Boston alone there are four or five large projects on the point of being let. These include the Employers' Liability Insurance building on Milk street, taking about 2000 tons of steel, the Tremont street theater and office building which is to be partly reinforced concrete but which calls for 1200 tons of steel, the Five Cents Savings bank building calling for 1500 tons, the new Statler hotel, for which plans are to be ready in two weeks with an estimated steel requirement of 5000 tons, and the new Keith theater calling for about 1000 tons of structural steel. The price of plain shapes holds firm at 2.40c, Pittsburgh. Plans are out for 1000 tons for the first section of the passenger station at Springfield, Mass.

Foreign Interests Cutting Prices

Philadelphia, Feb. 5.—Considerable concern is being caused among steel makers over the extent to which foreign finished steel is invading the tidewater consuming district. Several sales of French and Luxemburg structural shapes have been made recently to eastern consumers at prices undercutting the lowest American prices by about $10 a ton, delivered eastern consuming points. The foreign sales are known to exceed 6000 tons in the aggregate, although this business is being done quietly and a considerably larger amount may have been placed. Due to the stress of competition, American mills have offered as low as 2.25c, Pittsburgh. Foreign competition is causing concern due to the extent to which it may dominate the structural business of New York, Philadelphia, Baltimore and other tidewater points. The present duty of $3 a net ton is proving no barrier to foreign sellers. Operations of the eastern shape mills now average 80 per cent.

5000-Ton Job Up for Bids

Pittsburgh, Feb. 5.—Various plants proposed in the expansion at Sharon, Pa., of the Westinghouse Electric & Mfg. Co., calls for a total of about 5000 tons of structural shapes. The majority of the inquiries before fabricators here call for less than 100 tons. Several now out involve 100 to 400 tons each, such as a new building here on Penn avenue for the Schenck China Co., 300 tons, bids on which are in. The largest award of the past week, totaling 2000 tons went to Jones & Laughlin Steel Corp. for two schools in New York. Various fabricators report the receipt of several jobs involving a total around 100 tons in each case. The general opinion is that the price at which jobs finally are let is still too low. Plain material remains quoted at 2.50c base Pittsburgh. The inquiry rate still is high and all estimating departments are busy on proposals.

Current Awards Are Small

Cincinnati, Feb. 5.—St uctural shape current awards involve tonnages of 150 tons or less. Larger projects are pending such as the Masonic Temple at Portsmouth, O., involving several hundred tons and bridgework of the Louisville & Nashville railroad which aggregates 6500 tons. The Stacey Mfg. Co. is figuring on a number of gas holders which aggregate 5000 tons. In the Cincinnati district considerable work is being contemplated, although little is actively being brought up for figures. Several fabricators report more work on the boards at present than ever before for this period of the year. Plain material prices are firm.

Large Tonnages Still Up

Cleveland, Feb. 5.—Large tonnages of structural shapes continue to be projected although few have reached the closing point. Small lots involving up to about 60 tons each continue to be placed regularly, the aggregate being sufficient to book comfortably local fabricators. Some representatives of eastern mills now are discriminating in business taken, one fabricator recently having turned down a large tonnage because of the nature of the order and the booked up condition of its shops. Included in the work projected for future figuring is the Pennsylvania railroad grade elimination for which H. E. Culbertson Co., Hanna building, is engineer. Several thousand tons of structural material is expected to be used. Mill deliveries now are deferred from four to eight weeks depending upon the specifications and tonnage required. Award of 1400 tons for the United Banking & Savings Co. building is expected before the end of the week. Hunkin-Conkey Construction Co. is general contractor. Plain material prices are maintained at 2.50c, Pittsburgh.

Awards Materializing Better

Chicago, Feb. 5.—The 5000 tons of structural steel in the Union station train sheds at Chicago will be fabricated by the Mt. Vernon Bridge Co. The Llewellyn Iron Works, Los Angeles, has been awarded 1307 tons for the Security bank building in Long Beach, Cal. Argentine railroads have an inquiry out for 10,000 tons of structurals for railroad bridge work. Few new building projects have been announced in the past week but apparently the structural steel industry is entering into a period of awards rather than new projects. Due to extreme cold weather, building permits in January decreased slightly. Nothing has arisen to disturb the forecast that a record volume of structural business is pending. The plain material price is 2.60c, Chicago.

STRUCTURAL CONTRACTS PLACED

Building awards this week ..... 23,894 tons
Building awards last week..... 20,937 tons
Building awards two weeks ago.... 52,581 tons

5000 tons, Union station train sheds, Chicago, to Strobel Steel Construction Co. Mt. Vernon Bridge Co. to fabricate the steel.
2400 tons, Keeler hotel, Albany, N. Y., to A. E. Norton, Inc.
2000 tons, addition to Bellevue hospital, New York, to A. E. Norton, Inc.
2000 tons, two school buildings in New York, to Jones & Laughlin Steel Corp.
1400 tons, freight house for Louisville & Nashville railroad, New Orleans, to Lukens Steel Co.
1307 tons, Security Trust & Savings bank building, Long Beach, Cal., to Llewellyn Iron Works.
1200 tons, apartment at corner of Ninety-seventh street and Fifth avenue, New York, awarded by Dwight P. Robinson & Co., to Bancroft Jones Corp.
1100 tons, loft at 247-255 West Thirty-eighth street, New York, to Harris Structural Steel Co.
1000 tons, building for Railway Co-operative Building & Loan association, Vanderbilt and Forty-fourth street, New York City, reported in a recent issue as awarded to eastern independent, went to A. E. Norton, Inc.
800 tons, loft building at West Thirty-fifth street, New York, to Hedden Iron Construction Co.
750 tons, additions for Kohler Co., Sheboygan Falls, Wis., to Worden-Allen Co.
610 tons, addition to Garland building, Chicago, to Hansell-Elcock Co.
577 tons, repairs to Merchants bridge, St. Louis, to American Bridge Co.
500 tons, two oil storage tanks at Mare Island navy yard, Mare Island, Cal., to Pacific Tank Co.
500 tons, power house for Johns Hopkins university, Baltimore, to Dietrick Bros.
450 tons, store building for Stern & Mann Co., Canton, O.; reported awarded to Canton Bridge Co. through Melbourne Bros., Canton, general contractor.
400 tons, repairs to highway bridge at Atlantic City, N. J., to American Bridge Co.
375 tons, building for Lebanon Paper Box Co., Lebanon, Pa.; to McClintic-Marshall Co.
300 tons, Spring Canyon Coal Co., Storks, Utah, new coal tipple, to Wisconsin Bridge & Iron Co.
300 tons, building for Mutual Potteries Co., Trenton, N. J., to American Bridge Co.
300 tons, Medical Science building, University of West Virginia, Morgantown, W. Va., to

J. E. Moss Iron Works.
300 tons, temple and social hall, Brooklyn, N. Y., awarded through Auer & Son, general contractors, to George A. Just Co.
250 tons, loft at 8-10 West Thirty-seventh street, New York, to Easton Structural Steel Co.
250 tons, Bergen, Delaware Telephone Co., Jersey City, N. J., to Eidlitz & Ross.
250 tons, St. Joseph's hospital, Reading, Pa.; project abandoned.
200 tons, tainter gates for new dam for Wolverine Power Co., to Worden-Allen Co. J. Bick, Beaverton, Mich.; general contractor.
200 tons, highway bridge, Bridgeport, Conn., to American Bridge Co.
200 tons, bridge for Mobile & Ohio railroad, to Virginia Bridge & Iron Works.
175 tons,high school at Palmerton, Pa., to McClintic-Marshall Co.
Tonnage not stated, 153 beam bridges for Southern Pacific railroad, to Bethlehem Fabricators, Inc.

STRUCTURAL CONTRACTS PENDING

7000 tons, building for Insurance Co. of North America, Philadelphia; noted in a former issue as pending, expected to be closed this week.
6000 tons, Lake Young project, Seattle; all bids rejected. New bids probably will not be asked.
5000 tons, various buildings at Sharon, Pa., for Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.; bids being taken.
5000 tons, Masonic hall, St. Louis; pending.
3000 tons, Masonic temple, St. Paul; pending.
1400 tons, building for United Banking & Savings Co., West Twenty-fifth street and Lorain avenue, Cleveland; Hunkin-Conkey Construction Co. general contractor. Steel to be bought this week.
1300 tons, school No. 197, New York; T. A. Clark, 122 Livingston avenue, Brooklyn, N .Y., general contractor.
1300 tons, school No. 33, New York; Frynner & Hanner, 25 West Forty-fifth street, New York; general contractor.
1300 tons, alterations to Delaware & Hudson bridge at Troy, N. Y.; bids in.
1000 tons, theater and office building, Tremont street, Boston; bids being taken.
1000 tons, first section, passenger station, Springfield, Mass.; bids being taken.
1000 tons, Schroder-Konnel loft building, 215 West Fortieth street, New York; pending.
900 tons, woodworking shop for Southern railroad at Birmingham, Ala., action to be taken shortly on this and the 2000 tons previously reported for another unit of the plant by Dwight P. Robinson & Co., 61 Broadway, New York.
800 tons, addition to A. I. Namm & Son department store, Brooklyn, N. Y.; bids asked through the Thompson-Starrett Co., 49 Wall street, New York.
800 tons, Cutler loft building, 465 west Twenty-ninth street, New York; pending.
660 tons, Knights of Columbus hall, Columbus, O.; bids extended to Feb. 18.
500 tons, ore bridge for Donner Steel Co., Buffalo, N. Y.; pending.
460 tons, Union Land & Building Co., Youngstown, O.; Youngstown contractor reported low on general contract.
350 to 1500 tons, H. E. Bell building, Chicago; bids in.
300 tons, building on Penn avenue, Pittsburgh, for Schenck China Co., Pittsburgh; bids in.
300 tons, garage at Twenty-fifth street and Lexington avenue, New York; pending.
300 tons, Belle Harbor telephone exchange, Rockaway, L. I., New York; pending.
300 tons, newspaper building, Waterbury, Conn.; pending.
250 tons, Fink bakery, 506 East Seventy-sixth street, New York; pending.
200 tons, power plant addition for Public Service Corp. of New Jersey, Kearny, N. J.; bids asked.
150 tons, addition to Hayden avenue branch for Cleveland Trust Co., Cleveland; bids in this week.
100 tons, Union Safe Deposit bank, Stockton, Cal.; bids being received.
100 tons, municipal building, Canton, O.; pending.

Contract for Furnace

Youngstown, O., Feb. 4.—Contracts for the new 550-ton blast furnace to be built at the Indiana Harbor division of the Youngstown Sheet & Tube Co. were placed late last week with John Mohr & Sons, Chicago. Blast will be supplied by 16 tuyeres instead of 12 as has been customary heretofore, according to the best practice.

More Cars Being Sought

Formal Inquiry for 10,000 Bodies Expected Soon from Pennsylvania —New York Central Closes for 30 Switch Engines

RAILROAD TRACK MATERIAL PRICES, PAGE 387

New York, Feb. 5.—Heavy car lists are under contemplation by the Pennsylvania railroad and the New York Central, in addition to several other substantial inquiries and the local car market is taking on an unusually active aspect. Orders the past few days have not run heavy but this lull in buying is regarded as temporary. Included in locomotive orders are five for the International Great Northern; one for the Clover Valley Lumber Co.; and one for the Bridgton & Saco river, all going to the Baldwin Locomotive Works; and one switch engine for the Bennett mine, and another for the Toledo Furnace Co., awarded the Lima Locomotive Works.

The Duluth, South Shore & Atlantic railroad has placed 5000 tons of rails with the Illinois Steel Co.

The Pennsylvania formal inquiry for 10,000 car bodies is expected soon. The company has 12,000 necessary trucks. Eighty switch engines of the 100 locomotives for which the New York Central has been inquiring are reported as placed with the American Locomotive Co. and the Lima Locomotive Corp.

Sales of freight cars in January totaling 9170 show a slight decrease from those of December when 10,600 were reported as awarded.

Light Rail Prices Weaker

Pittsburgh, Feb. 5.—Further orders for billet-rolled light rails have been accepted at 2.15c, base Pittsburgh. That quotation now is out on a number of carload inquiries, but various coal producing interests' purchasing agents have indicated their intention of waiting for further reductions. Some producers believe more tonnage would have been sold had the market remained firm at 2.25c, base Pittsburgh, than now is being sold at the 2.15c price. One or two interests still quote 2.25c.

The Pennsylvania railroad still defers action on its 2000-ton inquiry for tie plates as do various other roads both on spikes and tie plate and other track accessory inquiries.

Prices on standard spikes still are at 3.05c to 3.15c; the American Steel & Wire Co.'s figure of 3.35c on small spikes has been met and the market is quoted at 3.35c to 3.50c. Most makers will not go below 3.50c, base Pittsburgh on boat and barge spikes. Tie plates are unchanged at 2.25c to 2.60c, Pittsburgh, while standard track bolts continue to be quoted at a minimum of 4.00c.

Wants Many Tie Plates

Cleveland, Feb. 5.—An inquiry for 675,000 tie plates has been put out by the Nickel Plate railroad. Not all of this quantity may be placed at this time No new rail business is in sight in this territory.

Brazil Railroad To Purchase

Washington, Feb. 5.—The Central Railway of Brazil is planning to buy 37 locomotives, 12 sleeping cars, six steel baggage cars, six steel mail cars, 850 freight cars, 50 ventilated box cars for carrying meat, and 50 refrigerated box cars for carrying milk and fruit on its broad gage lines, according to information received by the department of commerce. For the narrow gage lines, eight locomotives, four sleeping cars and 300 freight cars will be purchased.

Roads Figuring on Repairs

Chicago, Feb. 5.—Car repair programs of the railroads are coming to the front. The New York Central is understood to be contemplating repairs to 500 cars. One authority states that in the past ten days a total of 1500 car repairs for about a dozen railroads has been let in this district. The 4000 70-ton hopper cars for which the Norfolk & Western railroad is inquiring will take 25,000 tons of finished steel. Although the Louisville & Nashville railroad denies any activity in connection with the purchase of 3000 cars, local car builders are protecting themselves on the steel. The Chicago, Milwaukee & St. Paul railroad is reported framing a car program. Illinois Central activity is in prospect.

Activity in rails and track fastenings is not great and no large placements were made in the past week. Most carriers already have placed their requirements over the first half. In the aggregate, track fastening inquiry is fair but is in small lots. The Missouri Pacific railroad is expected to place its 12,000 tons of tie plates this week. Some roads, like the Rock Island and Great Northern, have not yet placed either fastenings or rails. Present active inquiry is light, with future buying hinging on those roads not yet in the market.

CAR ORDERS PLACED

Pennsylvania, 1000 box car bodies to Standard Steel Car Co., 1000 to Newport News Shipbuilding & Dry Dock Co., as reported in last week's issue, and 1000 to an unnamed builder.
Philadelphia & Reading, 50 stock cars, Standard Steel Car Co.
Chesapeake & Ohio, reported in a recent issue as awarding repairs of 1000 steel cars, distributed this business as follows: Richmond Car Works, 500 gondolas; American Car & Foundry Co., 250; and Newport News Shipbuilding & Dry Dock Co., 250.
Southern Pacific 50 miscellaneous coaches as follows: 23 baggage cars to Bethlehem Shipbuilding Co.; 15 dining cars to Pullman Co.; and six baggage buffet cars and six baggage horse cars to American Car & Foundry Co.
Fruit Growers Express, 500 additional underframes, to Western Steel Car & Foundry Co., 1000 bodies, reported to be built in own shops.

CAR ORDERS PENDING

Central Railway of Brazil, 12 sleeping cars, 6 steel baggage cars, 6 steel mail cars, 850 freight cars, 100 refrigerators; pending.
Atlantic Coast Line, 10 steel express and 7 baggage and mail cars; pending.
Santa Fe, 46 coaches; pending.
Lehigh Valley, 200 box car repairs; pending.
Universal Portland Cement Co., 50 hopper cars; new bids asked.
Rutland Railroad, 30 steel underframes for stock cars; pending.
Swift & Co., 100 stock cars; pending.
Pennsylvania Railroad, 10,000 freight cars, formal inquiry expected out soon.
Fruit Growers Express, 100 refrigerator car underframes, new bids asked.
Nickel Plate railroad, 1000 box cars, 300 stock cars; pending.
Atlantic Coast Line, 50 ballast cars; pending.

The Nonferrous Metals

Copper Easy but Other Metals Going Up—Zinc and Lead Strong—Tin Jumps 2c in Day

	Copper Electro delivered	Copper Lake delivered	Spot Straits New York	†Lead New York basis	Zinc St. Louis basis	Spot† aluminum	Spot antimony	Nickel spot
Jan. 30	12.75	13.00	48.37½	8.37½	6.50	27.00	10.50	29.00
Jan. 31	12.75	13.00	49.25	8.37½	6.50	27.00	10.50	29.00
Feb. 1	12.75	13.00	49.25	8.50	6.55	27.00	10.50	29.00
Feb. 4	12.62½	12.75	49.62½	8.75	6.60	27.00	10.50	29.00

†Outside market quotation.

NEW YORK, Feb. 5.—As a result of withdrawal of Guggenheim Bros., Phelps Dodge Corp. and American Smelting & Refining Co. from the Copper Export association effective Feb. 1, the export copper market has been thrown into confusion, with consequent lower prices in the foreign markets, which have been reflected in turn in the domestic market. Electrolytic copper has reacted from its recent high of 12.87½c, delivered, to 12.62½c, with still lower prices possible in some instances. Export business has been done at 12.70c, c.i.f. foreign port. Casting has declined to 12.37½c, refinery; lake, 12.75c, delivered. Scrap prices also have been easier.

Active buying of slab zinc by the steel sheet mills has resulted in further strength to the zinc market, especially in view of the good foreign demand and the stabilized zinc ore price. Price of slab zinc for February shipment has advanced to 6.65c, East St. Louis, and further increases have been expected. Brass special has been commanding a premium averaging 10 points; high grade has held at 8c to 8.50c, delivered.

The American Smelting & Refining Co. advanced its contract lead price $3 a ton Feb. 1 to 8.15c, New York, which advance was followed by a further rise in outside prices to 8.75c New York, and 8.40c to 8.45c East St. Louis. Europe has been consuming lead heavily as well as this country, while Mexican production has been slightly cut down by the unrest there.

Tin prices held steady in a dull market for a few days, with American prices below the import cost, enabling some arbitrage business by London houses. Then today the market shot up nearly 2 cents here on a jump caused by shortage in London. The Feb. 1 world statistics were regarded as unfavorable in this market, due to the increase in the world visible of 3361 tons. This increase was due to the appearance in the world's stocks of tin released from the Eastern pool and now showing in tin afloat and arriving.

No change has been announced in the domestic producers quotation for ingot aluminum, but premiums of 1 to 2 cents still obtain for ingot in the outside market. Outside quotations on 98 to 99 per cent virgin ingot range from 27c to 28c.

Mill Products

Base prices cents per pound, f.o.b. mill

SHEETS	
Base prices cents per pound, f.o.b. mill	
Copper, hot rolled, 4 oz., min.	20.50
High brass	17.25
Zinc, ga. 9 to 18 (plates ½c less)	9.50
Lead, full sheets (cut ¼c more)	11.75
Aluminum, base 18 ga. and up	36.40
SEAMLESS TUBES	
High brass	21.50
Copper	22.50
RODS	
High brass, round, ⅜ to 2½-inch	15.00
Naval brass rods	17.75
WIRE	
Copper	15.00 to 15.25
High brass	17.75

Old Metals

Dealers' buying prices cents per pound

HEAVY RED BRASS	
Cleveland	9.50
New York	8.50 to 8.75
Chicago	8.75 to 9.00
HEAVY YELLOW BRASS	
New York	5.50 to 6.00
Chicago	6.50
Cleveland	6.00 to 6.50
ZINC	
New York	4.00 to 4.25
Cleveland	3.75 to 4.00
Chicago, dross	4.50
HEAVY COPPER AND WIRE	
Cleveland	10.50
New York	9.75 to 10.00
Chicago	10.25
RED BRASS TURNINGS	
New York	7.25 to 7.50
Cleveland	8.25 to 8.50
Chicago	8.00
YELLOW BRASS TUBING	
Cleveland	6.00
NO. 1 BRASS ROD TURNINGS	
Cleveland	6.00
New York	6.00 to 6.25
Chicago	6.50
ALUMINUM BORINGS	
Cleveland	12.00

Strip Consumption Varied

STRIP PRICES, PAGE 387

Pittsburgh, Feb. 5.—Consumption of both hot and cold rolled strips covers a wide range of manufacture and is by no means confined to the automotive and allied industries. Makers are booked well through the first quarter but are so well up on shipments that deliveries within 30 days after orders are received are possible. Books not yet are open for the second quarter and operations are increasing somewhat the general average being between 75 and 80 per cent. Producers here report that they are not encountering cut prices even in the East where it was reported that 4.75c had been done on cold. They are obtaining 5.00c without difficulty and 3.00c, base Pittsburgh is firm on hot.

Cold-Rolled Is Established

New York, Feb. 5.—The market on cold-rolled strip steel now is pretty generally established in this territory at 4.75c base Pittsburgh. Hot-rolled strip steel generally is bringing 3.00c base Pittsburgh with somewhat lower in exceptional instances where attractive tonnages are involved.

Demand Improved

In By-Product Market—Gasoline Advance Strengthens Fuel Prices

New York, Feb. 5.—The market on light oil distillates reflects unusual strength. Industrial demand has improved with a result that many of the weaker holders are sold up and virtually out of the market. At the same time, gasoline has advanced about 4 cents, strengthening motor fuel prices directly and light oil distillates indirectly. The leading seller of distillates the past week has advanced 2 cents on benzol, solvent naphtha and toluol, and with many of the smaller interests sold up, these quotations now virtually represent the current market.

These prices are only on nearby positions. Business for March in benzol has been turned down in at least one case. Heavy contracting in motor fuel over recent weeks has diverted to this product much of the output of the larger sellers, who, while still in a position to book distillates are only able to do so in limited quantities.

Pure benzol may be quoted at 25 cents works, in tanks, and 30 cents in drums; 90 per cent benzol, 23 cents in tanks and 28 cents in drums; solvent naphtha, 25 cents in tanks and 30 cents in drums; and toluol 26 cents in tanks and 31 cents in drums. Xylol is strong, but unchanged at 27 to 29 cents works in tanks and 34 cents in drums.

Phenol producers are taking contracts around 26 to 27 cents, but they are booking no more of this business than the buyers' barest requirements dictate.

Sulphate of ammonia is holding at $2.70 to $2.75 works, for domestic account and $2.75 to $2.80 port in double bags, for foreign. Little business is being done, however. Current demand is not large, but at the same time supplies for nearby positions are scarce.

Coke Oven By-Products

Spot*

Per Gallon at Producers' Plants in Tank Lots	
Pure benzol	0.25
Toluol	0.26
Solvent naphtra	0.25
Commercial xylol	0.27 to 0.29
Per Pound at Producers' Plants	
Phenol	0.27
Naphthalene flake	0.06½
Naphthalene balls	0.07½
Per 100 Pounds at Producers' Plants	
Sulphate of ammonia	$2.70 to $2.75
Contract	
Pure benzol	$0.22
Toluol	0.24
Solvent naphtha	0.24
Commercial xylol	0.28
Per Pound at Producers' Plants	
Phenol	$0.27
Naphthalene flake	0.06½
Naphthalene balls	0.07½

*Spot distillates are subject to shading.

Much Activity on Coast

Pacific States Find Demand Continues for Steel—Pipe Lines and Tanks Consume Considerable Tonnage, With Others Pending

SAN FRANCISCO, Feb. 2.—While buying of iron and steel products is not heavy, each week since the first of the year has shown an improvement and the trade is pleased at the outlook. The feature of the past week was the decided improvement in demand for plates, over 1500 tons being awarded.

Construction activity is being well maintained for this time of year. Los Angeles reports for the first 15 days of the month 2500 permits with a valuation of $5,732,209, compared with 2753 permits and a valuation of $14,063,671 for the corresponding period in December.

Pig Iron and Coke

With one or two exceptions sales of pig iron and coke have involved small lots. One importer reports two sales of 500 tons each of continental iron at $30.50 c.i.f. coast ports. Spot lots are going at $33 to $34 a ton. As far as can be ascertained no large inquiries are before the trade this week.

Bars, Plates and Shapes

Merchant steel bars continue in little demand and bookings have been small tonnages. The Judson Mfg. Co. is planning to resume operations in its open-hearth department next week after annual overhauling. Foreign bars have been quoted as low as 2.08c c.i.f. duty paid, San Francisco. While reinforcing bar jobbers report numerous small tonnage awards only one large contract was made this week. Several thousand tons are pending and it is thought the majority of this will be placed within the next two weeks.

A decided improvement is noted in demand for plates and one interest has booked so far this month in small lots, more than in any month since last August. The East Bay Water Co., Oakland, has awarded a pipe line involving 400 tons of 3/16-inch material to the Steel Tank & Pipe Co. The Butte Electric Co. took the Mare Island navy yard contract for two 50,000-barrel tanks and electrical work and has sublet the tank work, involving 400 tons to the Steel Tank & Pipe Co. Bids were opened Jan. 31 for 400 tons of 22-inch pipe for Santa Cruz, Cal., involving material from 12 gage to 3/16 inch. All bids on the Lake Young development project at Seattle, 6000 tons, have been rejected and bids will not be called for again until a special ordinance has been passed. Prices are not strong and 2.85c, c.i.f. coast ports is being freely quoted.

While several awards of 100 tons each have been placed this week, action on all large fabricated jobs has been deferred. It is thought the majority of these larger contracts, involving 5000 tons or more, will be placed shortly. In the meantime numerous small tonnages are being booked. While 2.85c c.i.f. coast ports continues to prevail as the ruling price, a tendency to advance is noted, at least one mill already having asked 3.00c, and in several quarters it is thought this will be general before the end of the first quarter, due to heavy bookings being made now in eastern centers.

Other Finished Material

San Diego is opening bids today for special crossings and 155 tons of 85-pound rail. The Los Angeles Railway Corp. is asking figures on 2450 tons of 7-inch girder rails. The McCloud River Railway Co. has placed two Prairie type locomotives with the Baldwin Locomotive Works. The Western Pacific Railroad Co. opened bids Jan. 26 on 7780 kegs of spikes and 1127 kegs of bolts.

Mill representatives find improved demand for cast iron pipe from municipal and private sources. Awards recently have totaled 3500 tons, among which was 2250 tons of 4 to 10-inch class C pipe for Los Angeles, awarded to the Grinnell Co., representing a Belgian maker. While French made cast iron pipe has been selling in this market for some months this is the first time Belgian pipe was sold.

Pipe mill men report demand for oil country goods and standard pipe is active, with improvement especially in the former. Crude oil prices were advanced this week 25 cents a barrel and gasoline 2 cents per gallon. Undoubtedly this will stimulate demand for oil country goods in the older pump fields. Improvement in standard pipe stocks on the Coast is reported. No action has been taken on the 6000 tons for the Southern Counties Gas Co. The Pan American Petroleum Corp. has placed with an independent company 400 tons of 3 to 8-inch line pipe.

Northwest Building Large

SEATTLE, Feb. 2.—While features are lacking in the iron and steel trade practically all branches of the industry are active. General conditions continue promising and demand for iron and steel products is well sustained, gaining over January, 1923.

Building in Seattle continues active. Building permits granted this month will total more than $4,000,000, better than any month of 1923 which as a whole established a new record. New projects include a $650,000 apartment building, a $120,000 school structure and a $100,000 reinforced concrete factory for Henry Disston & Sons Co., Philadelphia, saw manufacturer.

Of interest to steel manufacturers is the higher rate tariff adopted by the Pacific westbound conference. Machinery was raised from $8.25 to $10, agricultural implements $9 to $10, automobiles $8 to $10 and iron and steel from $5 to $6.50. These are water rates from North Pacific ports to Japan, China and the Philippines and apply to commodities originating east of the Missouri river. Under present water tariffs the adjustment places North Pacific water lines and water services from Atlantic ports to the Orient direct on a rate parity.

Pig Iron and Coke

Buyers of iron are watching the situation with considerable interest. Importers regard the outlook as strong and expect higher prices. In the meantime consumers are placing orders for delivery two to three months hence. While British pig iron is strong and prices have advanced, declining exchange has resulted in lower c.i.f. quotations here. Importers are offering British and Scotch grades at $33, duty paid, although European iron is being quoted considerably under this level. Some French iron has been sold in San Francisco but results were not satistactory. In this market, only British iron is being sold as domestic iron cannot compete, because of high freight rates and local buyers are favorably inclined toward the best grades from Great Britain.

There is no change in the coke situation. Fernie, B. C., fuel is being sold steadily for mixing with local grades.

Bars, Plates and Shapes

Finished steel continues in good demand and prices are unchanged. Fabricators have a fair total of new work on hand. The local steel plant is enjoying a steady run, the call for reinforcing bars being in line with active construction work. Wholesale jobbers announce a reduction in track spikes from 4.50c to 4.25c. Prices appear well stabilized at all coast centers. Jobbers state that the business in January shows a large gain over January 1923.

Old Materials

The scrap market continues lethargic. No. 1 cast is scarce but there is sufficient for demand. Steel scrap is moving slowly. The city of Seattle has appropriated $957,913 for improvements in connection with the Gorge Creek hydroelectric plant, including substation and transmission lines. The city is advertising for 55,000 feet of galvanized wrought iron pipe and 4300 feet of 1-inch counterweight cable.

Local fabricators have been advised that Hai Ho Conservation commission, Tientsin, China, is preparing to receive tenders for a bascule or substitute type of steel bridge across the Hai Ho river, three spans, provision being made for a free fairway of 140 feet.

Production of Iron Turns Upward

With Total of 3,017,444 Gross Tons, January Pig Iron Output Shows Increase of 104,925 Tons Over December—Active Stacks Make Gain of 17, of Which 14 Are Steelworks, Bringing Total to 248 on Jan. 31

A SEVEN months decline in the production of coke and anthracite pig iron, or since last June, was broken in January when the first gain, something over 100,000 tons was registered. Indication of a continued improvement in operations is shown in the greater stack activity. During January 18 furnaces were blown in while only one was blown out. All but four of the furnaces blown in were of the steelworks class.

Production of pig iron in January totaled 3,017,444 gross tons, which compared with 2,912,519 tons in December, was an increase of 104,925 tons. The January output was the highest since October when the output was 3,142,642 tons. On an average daily basis, the January production was at the rate of 97,337 tons per day and was a gain of 3385 tons over the 93,952-ton daily output of the preceding month, or 3.61 per cent. The daily rate of production was also the highest since October when 101,375 tons of iron was being produced per day.

MONTHLY PRODUCTION

	1924	1923	1922
January	3,017,444	3,228,226	1,645,804
February	.....	2,993,918	1,630,180
March	.....	3,523,595	2,035,908
April	.....	3,546,308	2,070,161
May	.....	3,868,486	2,309,348
June	.....	3,667,868	2,362,455
Total 1st half	3,017,444	20,828,401	12,053,856
July	.....	3,684,677	2,403,030
August	.....	3,448,886	1,810,665
September	.....	3,117,526	2,024,008
October	.....	3,142,642	2,629,655
November	.....	2,891,191	2,846,110
December	.....	2,912,527	3,083,520
Total 2nd half	.....	19,197,449	14,796,988
Grand total	*3,017,444	40,025,850	26,850,844

AVERAGE DAILY PRODUCTION

	1924	1923	1922	1921	1920
Jan.	97,337	104,136	53,090	77,895	97,172
Feb.	.....	106,925	58,220	68,906	102,904
March	.....	113,664	65,674	51,447	108,895
April	.....	118,210	69,005	39,691	91,754
May	.....	124,790	74,495	39,202	96,510
June	.....	122,262	78,748	35,466	101,553
July	.....	118,860	77,517	27,892	98,190
Aug.	.....	111,254	58,408	30,802	101,468
Sept.	.....	103,917	67,466	32,859	104,143
Oct.	.....	101,375	84,827	39,821	106,075
Nov.	.....	96,373	94,870	47,165	97,836
Dec.	.....	93,952	99,468	52,992	87,105
Ave.	97,337	109,659	73,563	45,223	99,456

Merchant pig iron made in January totaled 709,099 tons a loss of 31,525 tons from the 740,624 tons made in December. Reduced to an average daily basis, the January production represented 22,874 tons per day, as against 23,891 tons per day during the previous month, a decline of 1017 tons. Nonmerchant or steelworks iron made in January, however, totaled 2,308,345 tons, showing an increase of 136,442 tons over the 2,171,903 tons of the preceding month. On a daily basis, steelworks output averaged 74,463 tons per day, which compared with the 70,061 tons per day of December, represented a gain of 4402 tons. From these figures it is seen that while merchant production continues to lose, the steelworks activity is overcoming this shrinkage by a wide margin.

Furnaces active on Jan. 31 totaled 248, this being a gain of 17 over the 231 operating on Dec. 31. During January, four merchant furnaces were blown in and one was blown out. Of the steelworks class, 14 were blown in and none was blown out. Of the 248 stacks active on the last day of the month, 68 were merchant and 180 were nonmerchant. On Jan. 31, the Steel corporation was operating 98 furnaces, as compared with 90 on Dec. 31.

Spiegeleisen made during January totaled 7948 tons and was a loss of 2324 tons from the 10,272 tons of January. Ferromanganese, however, with 19,735 tons was a gain of 1499 tons over the 18,236 tons of the preceding month.

According to announcements just made three blast furnaces are being dismantled. These are the Union furnace of Rogers, Brown & Co., at Ironton, O., Cambria C furnace of the Bethlehem Steel Co., at Johnstown, Pa., and the Shenango No. 4 furnace of the Shenango Furnace Co., at Sharpsville, Pa.

DIVISIONS OF PRODUCTION

1923	Merchant	Non-merchant	Spiegel	Ferromanganese	Other ferro
Jan.	713,186	2,515,040	12,056	19,358	952
Feb.	708,901	2,285,017	3,657	21,410	759
Mar.	767,219	2,756,376	13,832	20,730	236
April	795,558	2,750,750	7,440	20,810	670
May	909,726	2,958,760	9,533	19,568	892
June	899,102	2,768,766	18,184	19,717	874
July	900,496	2,784,181	12,876	26,493	776
Aug.	828,163	2,620,723	5,595	22,044	1,800
Sept.	734,754	2,382,772	4,478	23,206	1,860
Oct.	724,596	2,418,046	8,442	16,039	1,858
Nov.	726,686	2,164,505	16,783	14,839	3,259
Dec.	740,624	2,171,903	10,272	18,236	1,717
Tot'l	9,449,011	30,576,839	123,148	242,450	15,653
1924					
Jan.	709,099	2,308,345	7,948	19,735	....

JANUARY PIG IRON

	No. of stacks	No. in blast last day of month Jan.	Dec.	Total tonnage made—Merchant	Nonmerchant	Total—Jan.	Dec.
Pennsylvania	148	95	88	162,748	875,430	1,038,178	991,798
Ohio	78	52	48	135,599	596,849	732,448	699,951
Alabama	42	24	22	114,080	111,598	225,678	212,844
Virginia	19	3	3	11,190	.....	11,190	14,211
New York	27	18	18	94,138	114,941	209,079	202,718
New Jersey	4	2	2	18,038	.....	18,038	18,953
Illinois	26	20	17	102,279	188,789	291,068	278,032
Colorado	5	2	2				
Indiana	16	14	14	19,314	294,617	313,931	313,228
Maryland	6	4	4				
Wisconsin	6	1	1				
Kentucky	7	1	1				
West Virginia	5	4	3	5,691	58,377	64,068	61,954
Tennessee	14	1	1				
Georgia	2	0	0				
Texas	1	0	0				
Minnesota	3	3	3	33,705	52,378	86,083	88,613
Michigan	4	4	4				
Missouri	1	0	0				
Spiegel and ferro—all states	..	..	..	12,317	15,366	27,683	30,225
Totals	414	248	231	709,099	2,308,345	3,017,444	2,912,519

Among the furnaces blown in during the month were: In Ohio: Cleveland No. 2, Otis Steel Co.; Dover, M. A. Hanna Co.; Hubbard No. 2, Youngstown Sheet & Tube Co.; Haselton No. 2, Republic Iron & Steel Co. In Pennsylvania: Cambria H and J, Bethlehem Steel Co.; Brooke, E. & G. Brooke Iron Co.; Midland No. 2, Pittsburgh Crucible Steel Co.; one Edgar Thomson, one Lucy, one Isabella and one New Castle, Carnegie Steel Co. In West Virginia: Top, Wheeling Steel Corp. In Alabama: Bessemer No. 2, Tennessee Coal, Iron & Railroad Co.; Woodward No. 3, Woodward Iron Co. In Illinois: South Works Old No. 2, South Works New No. 8 and Joliet No. 1, Illinois Steel Co.

The only stack blown out during the month was the Sharpsville, Pa. furnace of the Allen S. Davison Co.

A voluntary petition in bankruptcy was filed Jan. 24 against the Western Brass Mfg. Co., Milwaukee, with works and offices at 241-3 Reed street. S. M. Liebenberg is president of the corporation.

Freight Increase

Estimated at $1,000,000 on Iron and Steel If Railroad Proposal Stands

Washington, Feb. 5.—Holding that the proposed increases of the short haul rates by the railroads of western Pennsylvania, eastern Ohio and northern West Virginia would add not less than $1,000,000 annually to the freight cost of iron and steel materials, steel companies have been filing briefs with the interstate commerce commission preliminary to a hearing before the commission soon. The railroads proposed these increases, which steel companies estimate would be as high as 50 and 60 per cent, to eliminate the so-called fourth section violations which the commission had condemned in its disposition of the case of the American Bridge Co. against the director general of railroads and the involved carriers, refusing reparation on the short haul rates and holding that the joint rates were higher than the aggregate of the intermediate rates.

Forty-two iron and steel companies and commercial organizations had protested against the proposed increased rates. Among the protests against the higher rates was that by the Jones & Laughlin Steel Corp., which claimed that no departures from the fourth-section rule had been made from its shipping point at Woodlawn, Pa., on shipments to eastern Ohio localities. The carriers contended that increases from Woodlawn were necessary to prevent disruption of long established rate relationships. In its brief filed Saturday, the Jones & Laughlin corporation holds that the proposed revision as a whole will put a tremendous additional freight charge on iron and steel. The United States Steel Corp. computed present and proposed charges, the brief points out, and found that the new rate would impose an annual increase of about $488,000, or about 25 cents a ton, on its shipments. The Bethlehem Steel Corp.'s added bill is about $68,000, the brief states, and continues: "It is probably safe to estimate the added freight at not less than $1,000,000 annually for all shippers. Yet the carriers have treated their rates without any regard whatsoever to the added freight costs. The revision is on a scale that constitutes a revenue question; but the carriers have approached it as though it were a minor rate adjustment."

The Bethlehem Steel Corp., in the American Bridge Co. case, says in its brief:

"This general advance is proposed closely upon the heels of the finding by the interstate commerce commission that conditions warranted a general reduction in all rates of 10 per cent.

"Many of the proposed rates will exceed even the peak figures prevailing prior to that decision and will, if applied, be the highest in railroad history in this territory. This general advance is proposed notwithstanding the earnings of the respondent carriers have recently shown a general and substantial upward trend.

"The commission of general traffic officers who sponsor this general advance gave no consideration to the general revenue to be exacted from this traffic nor the ton-mile nor the car-mile earnings which the rates will produce. Yet the proposed rates will, if applied, place upon this single item of traffic in the territory described an additional freight burden of about $1,000,000 annually.

"This startling proposed general increase provoked suspension orders from the interstate, Ohio and West Virginia commissions and a formal complaint proceeding before the Pennsylvania commission. The carriers have voluntarily suspended the state rates in Pennsylcania and have stated by counsel that the suspension of the rates will be continued until passed upon finally."

Kalman Steel Co. Absorbs Corrugated Bar Co.

Amalgamation of the Corrugated Bar Co. of Buffalo and the Kalman Steel Co., Chicago, through the purchase of the former by the latter, makes this one of the largest distributors of reinforcing steel bars in the United States. The resulting company will assume the name of the Kalman Steel Co. and will be capitalized at $2,000,000. Possession will be taken at once of the plants of the Corrugated Bar Co. and actual operation as a united company will start in about 30 days.

The Corrugated Bar Co. was organized in 1892 and the Kalman Steel Co. in 1901. The former has plants at Hammond, Ind., Buffalo, Boston, Philadelphia and Atlanta and the latter at Chicago, New York, Youngstown, St. Paul and Minneapolis. After March 22 the offices of the company will be the fourteenth floor of the Wrigley building, Michigan boulevard and Chicago river, Chicago. Paul J. Kalman will be president and George E. Routh Jr., vice president. J. A. Cathcart is assistant vice president and A. E. Pinard, treasurer. A. P. Clark, general manager of sales of the Corrugated Bar Co., will assume the same position with the new company and W. S. Thompson, chief engineer for the Corrugated Bar Co., will occupy that post with the Kalman Steel Co. L. O. Helgelsen will be eastern sales manager at New York.

Scrap Advance Halted

(Concluded from Page 883)

ing practically nothing. Several leading users in the Portsmouth district have sufficient stock on hand or due them on contracts for the next couple of weeks. Dealers believe the lull is temporary and the market instead of declining will advance. Heavy melting steel continues the most active item, although a fair demand exists for foundry grades and material for rolling mill use. Recent heavy deliveries are reflected in much larger and better assorted stocks in dealers' yards.

Weakness at Detroit

Detroit, Feb. 4.—The iron and steel scrap market is easier in most lines. Large consumers are out of the market and buying is with more scrutiny of quality than formerly. Consumers have embargoed many shipments. Producers are more active and dealers say offerings are more liberal than for two months.

Demand Holds Good

St. Louis, Feb. 4.—Demand for all grades of iron and steel scrap is good and the market reflects decided strength. Purchasing is mainly in small quantities, but large in aggregate, and there is little doubt that in some quarters material is badly needed. Supplies generally are light and not sufficient to carry much beyond the middle of March. One factor in the strength, particularly in steel grades, is that approximately 12,000 tons have been shipped to eastern consuming points. Inquiries come from the East, and apparently an almost limitless outlet exists at the moment in that direction.

Market a Little Stronger

Birmingham, Ala., Feb. 4.—The southern scrap market is stronger and a better demand is felt for some of the grades. Melters of stove plate and No. 1 cast, as well as special melting steel are buying some tonnage. Heavy melting steel activities are tempered greatly by the largest consumer and while there has been a slight increase in price stability of the market cannot be claimed. Borings and turnings are finding sale.

Marked Down at Cleveland

Cleveland, Feb. 5.—Iron and steel scrap prices are weak. Uncertainty as to the trend of the market and absence of important buying on the part of consumers are largely responsible for this condition, most users confining transactions to moderate tonnages for immediate needs.

Advance Halted in East

Philadelphia, Feb. 5.—The principal iron and steel scrap transactions in the past week have been buying by dealers on orders. Sales of steel scrap to consumers recently has aggregated several thousand tons. On this business prices have ranged from $19.50 to $20, delivered for heavy melting steel. The market generally is firm and unchanged but the advancing tendency has been halted, while in some grades slightly lower prices are being done than during the excitement of the preceding week.

British Strike Recovery Is Slow

Some Iron and Steel Plants Not Yet Back in Operation—Welsh Production Loses 340,000 Boxes of Tin Plate—Continential Makers Continue Making Low Offers—Germans Building Steelworks Outside French Control

Iron Trade Review Staff Cable

European Headquarters,
IRON TRADE REVIEW,
2-3 Caxton House, Westminster, S. W.1

LONDON, Feb. 5.—Recovery in the iron and steel industry from the effects of the British railroad strike is slow and several plants have not yet resumed operations. Loss of production of Welsh tin plate due to the strike is placed at 340,000 boxes. Meanwhile manufacturers on the continent continue to make low offers, though the tonnage is in less volume. German producers have sold to Japan for April delivery steel bars at £6 5s ($26.93) and rods at £8 ($34.48) f.o.b. India works have submitted bids of £14 10s ($62.49) c.i.f. on nails for Japan. New steelworks are being built at Kiel outside of the zone under the control of France. British consumers have purchased considerable tonnage of Belgian basic iron at £4 ($17.24) f.o.b. Belgian beams have been have been sold in the week at £7 10s ($32.32), Birmingham. British manufacturers of black sheets are increasing their operations, while the galvanized mills are reducing output.

Changes in prices in the British market bring the following products to the levels as quoted: Steel bars for home use £9 10s ($40.95); for export, £9 ($38.79); English and Scotch beams for export £8 10s ($36.64); sheets for domestic use £13 10s ($58.19), for export £13 ($56.03); galvanized sheets £18 5s ($78.66).

Sterling exchange is figured on a basis of $4.31.

British Steel Hurt by Continental Prices

European Staff Special

Office of IRON TRADE REVIEW,
Prince's Chambers, Corporation St.

BIRMINGHAM, Eng., Jan. 18.—Steady recovery of Britain's export trade in iron and steel is indicated by the board of trade returns, showing exports for last year amounting to 4,437,349 tons comparing with 3,553,625 in 1922. Figures of production are also considered fairly satisfactory, the output of pig iron during December being 626,900 tons, an increase of about 28,000 tons on the previous month. The production of steel was 653,300 tons which would have been much larger but for extended holidays, yet comparing with 546,100 in December, 1922.

The trouble at the moment is foreign competition. The inability of the revised plate and bar associations to function as their reorganizers intended is due to drastic cutting by France and Belgium with the aid of low exchange values. At present Brussels exchange is 100½ francs to the pound and Paris about 91. Belgian steelmakers on this basis are quoting billets at £5 15s ($24.44) f.o.b. channel ports. One sale is reported in Birmingham at £6 4s ($26.35) delivered. A more general price is £6 17s 6d ($29.22) but several sales have been made at £6 10s ($27.63).

It is practically impossible for English steelmakers to meet this competition. On the Birmingham exchange quotations for billets were made at £8 10s ($36.12) but none were bought at above £8 ($34.00) and large dealers count upon still lower prices. However, a special fight is being concentrated on overseas business, and under the stress of competition joists are now commonly quoted £1 ($4.25) lower for export orders. Thus the home price is £10 ($42.50) and the foreign price £9 ($38.25). Two firms at least who are outside the association are taking home orders at £9 17s 6d ($42.02). But foreign joists are quoted at £6 10s ($27.63) f.o.b. Antwerp or about £8 ($34.00) delivered.

Sterling—$4.25

The Staffordshire iron trade is chiefly interested in the destructive competition under which No. 3 Belgian iron for nut and bolt making is delivered here at £8 12s 6d ($34.53). The Staffordshire manufacturer is selling nut and bolt iron at £11 ($46.75) but he badly needs more money, having to pay more for his coal and pig iron. It is hopeless to attempt to raise prices. The Lancashire maker, however, has taken his courage in both hands and put up the price to £11 10s ($48.87) making this the minimum. At least one contract was concluded for nearly 1000 tons of cheap Belgian iron this week by a Black Country firm.

Pig iron is subject to this kind of competition, Cleveland smelters having lost a good deal of their Scotch trade, French foundry iron of good quality being landed on the Clyde at 10s ($2.12) cheaper than Cleveland iron can be delivered. Several Middlesbrough steelworks are reported to have bought Continental basic pig iron fully 10s ($2.12) per ton below the local product. The same competition has reduced export trade from the Tees and it is likely that the first month's exports of the year will make a poor showing. Middlesbrough No. 3 remains at £4 19s ($21.04) and East Coast hematite at £5 2s 6d ($21.78).

The position is similar in Barrow-in-Furness where makers counted upon the restarting of several furnaces in January. At present there are only 14 furnaces at work there, as compared with the prewar average of 25. Consumers are buying carefully. Coke continues a troublesome element. On the West Coast coke coming from the Durham district costs £2 3s ($9.14) delivered. At Middlesbrough

Ruhr Steel Dumping Is Mere Bogy

European Staff Special

LONDON, Jan. 21.—Certain European iron, steel and banking interests are again becoming agitated over the alleged possibility of large quantities of German steel made in the Ruhr and stored during the period of passive resistance being dumped on exports markets without regard to price. A dispatch from Paris gives the total of these stocks of steel as 3,000,000 to 4,000,000 tons. This is obviously absurd, the total steel production of Germany last year having been reliably estimated at around 5,000,000 tons. A large share of the steel accumulated during passive resistance has already been sold and is now being distributed. The tonnage involved was not excessive. Production is not being resumed rapidly and, therefore, it is not likely that export markets will be seriously troubled with Ruhr steel this year, particularly since the cost of production in Germany at present is high. Low prices are now being named for export by both Germany and Belgium but this is due to currency depreciation and surplus steel accumulated out of current production.

Current Iron and Steel Prices of Europe

Last Reported Prices Converted into Dollars at Rates of Exchange, February 4

British Market

Corrected to Date by Cable
Home Market Prices. Gross Tons at Works or Furnace

	$	£	s	d
SEMIFINISHED STEEL				
Billets, soft steel	32.33	7	10	0
Sheet bars	32.33	7	10	0
Wire rods	47.41	11	0	0
FINISHED STEEL				
Steel bars, England, ⅝ to 3-inch	40.95	9	10	0
Steel bars, England, ⅝ to 3-inch, for export	38.79	9	0	0
Plates, ship, bridge and tank, England	40.95	9	10	0
Plates, ship, bridge and tank, England, for export	38.79	9	0	0
Plates, ship, bridge and tank, Scotland	40.95	9	10	0
Plates, ship, bridge and tank, Scotland, for export	38.79	9	0	0
Beams, England	40.95	9	10	0
Beams, England, for export	36.64	8	10	0
Beams, Scotland	40.95	9	10	0
Beams, Scotland, for export	36.64	8	10	0
Sheets, black, 24 gage	58.19	13	10	0
Sheets, black, 24 gage, for export	56.03	13	0	0
Sheets, galvanized, 24 gage	78.66	18	5	0
Rails, 60 pounds and over	38.79	9	0	0
Rails, 60 pounds and over, for export	37.71	8	15	0
Tin plate, base box 108 pounds	5.23	1	4	3
Steel hoops	51.72	12	0	0
Steel hoops, for export	48.49	11	5	0
PIG IRON				
Hematite, East Coast, Mixed Numbers	22.09	5	2	6
Hematite, West Coast, Mixed Numbers	23.17	5	7	6
Basic, Middlesbrough	20.47	4	15	0
No. 3, Foundry, Middlesbrough	21.33	4	19	0
No. 3 Foundry, Derby, Leicester, Nottingham	20.47	4	15	0
No. 3 Foundry, Northamptonshire	19.93	4	12	6
No. 3 Foundry, Staffordshire	20.47	4	15	0
No. 3 Foundry, Scotch	22.63	5	5	0
Ferromanganese, 76 to 80 per cent	73.27	17	0	0
COKE				
Yorkshire furnace	5.82	1	7	0
Yorkshire furnace, for export	7.33	1	14	0
Welsh foundry	7.00	1	12	6
Welsh foundry, for export	8.62	2	0	0

Where no separate export prices are given, same quotations apply to domestic and foreign business.

German Market

Prices Last Reported
PIG IRON

	$	Pounds per metric ton (2205 lbs.)
Hematite	22.05*	5 2 2
Foundry, No. 3	21.55	5 0 0
Stahleisen, Siegen	25.12	5 16 7
Foundry, No. 1	22.05	5 2 2
Luxemburg Foundry, No. 3		Nominal
COKE		
Lower Silesian furnace	9.05	2 2 0
Lower Silesian foundry	9.12	2 2 2
SEMIFINISHED STEEL		
Billets	30.17	7 0 0
Sheet bars	30.60	7 2 0
Wire rods	34.48	8 0 0
FINISHED STEEL		
Standard rails	30.17	7 0 0
Merchant bars	31.25	7 5 0
Structural shapes	30.82	7 3 0
Ship plates	39.01	9 1 0
Medium plates, 3 to 5 millimeters	40.30	9 7 0
Sheets, 1 to 3 millimeters	39.65	9 4 0
Tin plate, per box of 575 kilograms	6.25	1 9 0
Plain wire	48.49	11 5 0
Bands and strips	43.10	10 0 0

All prices are f.o.b. furnace or mill.
*German prices now are quoted in pounds, sterling.

French Market

Prices Last Reported
PIG IRON

	$	Francs per metric ton (2205 lbs.)
Hematite, Lorraine	20.48	440
Basic bessemer, Lorraine	17.69	380
Foundry, Longwy, No. 3, sand-cast	17.22	370
Foundry, Longwy, No. 3, chill-cast	17.69	380
Ferromanganese, 76 to 80 per cent	72.15	1,550
COKE		
French furnace	6.75	145
German furnace, f.o.b. frontier*	10.24	220
German furnace, f.o.b. frontier**	10.85	233
French foundry	7.45	160
SEMIFINISHED STEEL		
Blooms	21.88	470
Billets	23.51	505
Sheets bars	23.97	515
FINISHED STEEL		
Standard rails	25.37	545
Merchant bars	26.53	570
Angles	25.84	555
Normal beams and profiles	25.84	555
Plates, ship and tank, 10 millimeters and thicker	29.56	635
Plates, bridge and tank, 5 to 10 millimeters	30.72	660
Sheets, black, 3 millimeters	32.59	700
Sheets, blue annealed, 2 millimeters	36.31	780
Shafting, cold-drawn, 40 to 60 millimeters	53.53	1,150
Bars, 2 per cent nickel steel	84.95	1,825

All prices are f.o.b. furnace or works.
*Up to 50 per cent of normal requirements.
**Over 50 per cent of normal requirements.

Belgian Market

Prices Last Reported
PIG IRON

	$	Francs per metric ton (2205 lbs.)
Basic bessemer, Belgian	16.75	405
Basic open-hearth, Belgian	17.57	425
Gray forge, Belgian	16.62	420
Foundry, No. 3, Belgian	17.16	415
Foundry, No. 3, Luxemburg	16.95	410
Foundry, No. 3, Lorraine	16.95	410
SEMIFINISHED STEEL		
Blooms	22.12	535
Billets	23.36	565
Sheet bars	24.19	585
Wire rods	33.08	800
FINISHED STEEL		
Standard rails	28.95	700
Merchant bars	27.29	660
Normal beams and profiles	25.02	605
Plates, 5 millimeters and thicker	29.57	715
Sheets, black, 3 millimeters	32.25	780
Sheets, galvanized, 1 millimeter	78.57	1,900
Plain wire	49.62	1,200
Galvanized wire	62.03	1,500
Wire nails	51.69	1,250

All prices are f.o.b. furnace or works.

the price is £1 16s ($7.65) to £1 17s ($7.86) but this is an excessive figure. The export figure for furnace coke shows signs of weakening. In the Midland area complaints are chronic of inability to get supplies. One anxious buyer a few days ago was quoted £2 ($8.50) per ton delivered on the ground that this was the price which the maker could get by the sale of his fuel abroad.

The Staffordshire ironworks are busier and look forward to still more work when the specifications for the rolling stock orders reach the mills. The price for best iron is maintained at £14 10s ($61.62) while for medium bars the £12 10s ($53.13) figure which for a long time has been nominal has now become the minimum.

The average net selling price of No. 3 Cleveland pig iron for the last three months is certified to have been £4 15s ($20.19) against £4 19s 7d ($21.17) for the previous three months and under the sliding scale arrangement North East Coast blast furnacemens' wages are reduced by 10½ per cent for the current quarter leaving wages 27½ per cent above the standard.

Galvanized sheet prices are slightly easier at £18 7s 6d ($78.15) owing to the lull in current buying. Mills are well situated for some months. Makers generally are booked for three months at least.

Production of tin plate is expanding with several mills in course of erection. Makers have no difficulty in obtaining £1 4s 3d ($5.15) per box f.o.b. works port, second hand parcels being 3d ($0.05) per box cheaper. The market has been disturbed by the upward tendency of tin. The black sheet trade, although rather quiet, is gradually expanding on account of improved automobile demands and various stamping requirements. The price of tin and sheet bars continues at £8 18s 9d ($37.94) subject to the usual rebate of 7s 6d ($1.59.)

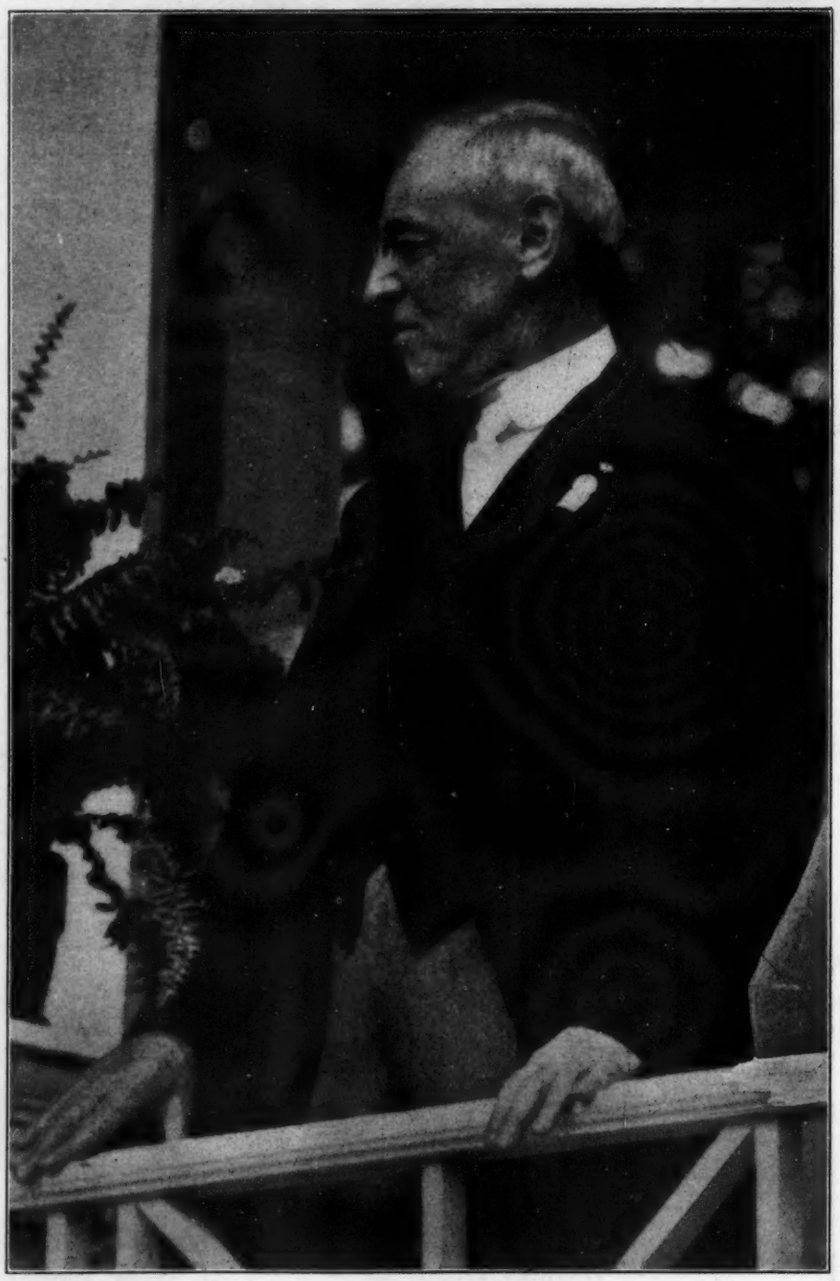
Ruhr Duties Modified

London, Feb. 5.—It is again possible to ship goods through occupied Germany to unoccupied territory and other parts of Central Europe without payment of taxes or duties to the Franco-Belgian authorities. During the worst of the Ruhr trouble last year this traffic was stopped and business between Western and Central Europe was seriously interfered with. Goods to occupied Germany or originating in occupied Germany destined for the outside are still subject to this additional duty.

Wilson Ideal Stamped on Industry

Many Legislative Reforms Credited to His Administration Still Part of Nation's Business Fabric — Federal Reserve System, Trade Commission Among These

BY E. C. BOEHRINGER



WASHINGTON, Feb. 5.—Personal appraisements of the services of Woodrow Wilson to the nation are as divergent as the poles, they invariably are extravagent praise or unreasoning criticism, but concerning the volume of legislation enacted and the close co-ordination of business and industry with the government during his presidency there can be no difference of opinion.

Barring possibly the civil war period, the Wilson administration in the eight years ended March 4, 1921, established a record for legislative and executive activity. To a large extent the entry of the United States into the World war was responsible. Nevertheless, in the peace years of the Wilson regime, before the European war clouds darkened America, a prodigious amount of grist went through the legislative mill.

Woodrow Wilson came to the presidency a reformer of business. He was fresh from his victories in New Jersey. The repute that won him the support of the progressive element of the Democratic party and the nomination at Baltimore in 1912 was entirely engendered at Trenton. On the stump in 1912 he was the champion of small business, the foe of the suppression of competition. His was the promise of "pitiless publicity." His early messages to congress, which he emphasized by delivering in person, a custom that had lapsed since the day of the second Adams, literally breathed fire.

He prodded congress into extraordinary activity. Within one year from the time he entered the White House the Underwood tariff act, with the longest "free list" in American history, had supplanted the protective Payne-Aldrich act. The federal reserve system had been brought into being, the nation's policy on Panama canal tolls had been reversed, a government railroad in Alaska authorized as a means of furthering the development of natural resources there, the parcel post system greatly extended, modified self-government accorded the Philippine islands and teeth put into the Sherman antitrust act.

In those prewar days the federal trade commission, the federal reserve board, the United States tariff commission and the United States shipping board were born. The Wilson bill proposing the creation of the trade commission was emasculated in committee and the high hopes entertained for it by its sponsors could not be fulfilled. The steel industry has felt the sting of the commission through the action against Pittsburgh plus, the demand for the submission of monthly production cost reports, and the later complaints against the various steel mergers.

The Republican contention that the federal reserve system was the evolutionary product of thought that chanced to crystallize in a Democratic administration is doubtless well-founded, but the system was made an entity by a Democratic congress and a Democratic president. Its success has not been questioned. The spectacle of the United

The author was Washington correspondent of IRON TRADE REVIEW *during a large part of the Wilson administration.*

States being shorn of an international delivery system when the World war impressed all shipping into the services of the allies prompted the creation of the shipping board. Its object was largely to be to the shipping industry what the interstate commerce commission has been to the railroads, but it was shortly thereafter saddled with the construction of a wartime fleet and the direction of the Emergency Fleet corporation. The tariff commission, a body that has proved most disappointing and has won the confidence of neither congress nor any succeeding President, was a by-product of the Underwood tariff act.

A noncomitant to the federal trade act was the Clayton act, enforced partially by the department of justice and partially by the trade commission. Interlocking directorates were prohibited and exact definitions of some of the cloudy phases of the Sherman act set down. The enactment of the federal reserve act precipitated a currency reform that has been an entire success thus far. The first legal income tax levy came in the early days of the Wilson administration.

The realization of the certainty that America would be drawn into the European maelstrom quite naturally influenced legislation as 1916 wore on. Following the declaration of war in April, 1917, an enormous amount of war legislation was enacted. Congress placed literally limitless authority in Woodrow Wilson's hands. The Lever act was as sweeping a bit of legislation as any American congress has ever made law.

The war industries board, the national council of defense, the railroad administration, the coal administration, the Emergency Fleet corporation all are history now, but their effects will be long in being obliterated. Without doubt the times demanded price fixing, the amalgamation of the railroads into one system, the laying down of as many keels as existing and hurriedly-constructed ship yards would permit, and the continued operation of the coal mines even at the price exacted by union labor. The difference of opinion arises over the quality of judgment exercised and the rapidity with which the government withdrew its suzerainty over business after the close of the war.

There is no doubt that during the eight years of the Wilson administration organized labor was unduly favored. Peculiarly, Woodrow Wilson dominated some federal departments and ignored others. He was his own secretary of state throughout but permitted without question what amounted to American Federation of Labor direction of the department of labor. The railroad brotherhoods stampeded President Wilson into forcing the Adamson act through congress and from the blows that followed the railroads have not yet recovered.

The revenue act of 1918 carried the high income surtaxes which the present administration is attempting to terminate. It might well have been that with normal direction from the White House, wartime taxation would have been reduced immediately and the Republican revenue act of 1921, instead of merely ending the excess profits tax and continuing the high surtaxes, would have been a real stepdown instead of merely a beginning. Possibly the railroads might have been turned back to their owners sooner, and before the helping hand of legislation like the Cummins-Esch act was available. These are but two examples of "what might have been."

No President faced sterner decisions than Woodrow Wilson and most of them he met resolutely. The promptitude with which he declared for conscription and its parallel in the business world, through the medium of price fixing and governmental control, must be admired. Time charitably softens judgments. There has never been any doubt that such errors as he may have committed were the products of stress and not of a punitive mind. Future generations will marvel at the celerity and sincerity with which Big Business rallied to the support of the government during the World war and put aside its selfish aims in the great national interest.

Important Laws Sponsored by Wilson

WASHINGTON, Feb. 5.—Although for years the leader of a political party which has been committed to the curbing and control of so-called big business and financial enterprise, the administration of Woodrow Wilson has left legislation and institutions retained as a constructive legacy to industry and business. Other policies advocated and promoted by Mr. Wilson have been criticized severely as burdensome and restrictive to the welfare of industrial activity and security, and since have been repealed or eliminated.

Notable among the achievements of the eight years of the Wilson regime was the enactment early in the first term of the federal reserve banking act, which gave stability to banks and to credit and provided the nation with an elastic currency. The postal savings bank system amendment broadened the scope of the postal bank system and increased the maximum amount to be deposited.

The federal trade commission act, fathered by Senator LaFollette, of Wisconsin, was passed during the Wilson administration, with authority to suppress alleged unfair practices in commerce and industry. The Clayton antitrust act, supplementing in a way the Sherman law, also was passed during the Wilson regime.

The tariff commission act, adopted during the Wilson administration, was designed to take the tariff out of politics, and under this the present tariff commission is functioning. The income tax law, providing a graduated system of income tax, the inheritance tax act and the excess profits tax, the latter having since been repealed as unsound and destructive, were adopted in the Wilson administration.

Among the wartime and semiwar measures passed in the Wilson term of office were the farm loan act, the Smith-Lever agricultural extension act, the cotton futures act, the federal warehouse act, giving the government regulation of warehouses and providing negotiable warehouse receipts, the uniform grain grading act, and the creation of a department of labor, making the head thereof a member of the President's cabinet. The workmen's compensation act, providing payments in accident and death in industry, also was enacted by congress in this administration.

The shipping law, which established the shipping board and the Emergency Fleet Corp., and which still exist, for the purpose of fostering a naval auxiliary, a naval reserve and a merchant marine, has proven an extremely costly venture for the government in time of peace because of the apparent impossibility of successful operation on the part of the government of its own ships. The shipping board and the Emergency Fleet Corp. now are practically divorced from each other under a make-shift plan by which the government hopes eventually the ships may be turned back to private operation under some plan yet to be determined.

Under the Wilson administration, congress authorized $11,000,000 for a government armor plate plant for wartime needs and $20,000,000 for the government nitrate plant at Muscle Shoals, Ala., which since has been the subject of much controversy.

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Woodrow Wilson and Business

WOODROW WILSON lent the force of his leadership to more legislation affecting business than any American president since Lincoln. From the time of his first victory in 1913, when he forced the passage of the "competitive" tariff bill, until the end of his tragic fight for the league of nations in 1921, his influence on the financial and industrial activities of the nation was far reaching and positive.

Of the great mass of prewar legislation ground out during the first administration, the act establishing the federal reserve system stands foremost in the list of Wilson's achievements. Although others share with him the credit of creating this great banking institution, Wilson was responsible for nursing it to life and setting it up as a bulwark against national financial panic. The federal trade commission and the shipping board, both products of the first administration, were largely regulatory as conceived by the President, but political tampering and the exigencies of the war soon exposed them to tasks for which they never were intended. Likewise the Underwood tariff, the tariff commission, Clayton act, the reversal of policy on Panama tolls, the extension of the parcel post system, the authorization of the Alaskan railroad, the plan for modified self-government in the Phillipines and many other acts of the Democratic administration were soon overshadowed by the excitement attending international affairs. As the war executive, Wilson created the war industries board, national council of defense, railroad, fuel and food administrations, emergency fleet corporation and other commissions at a time when all thoughts were focused on winning the conflict. Vitally as they affected business, they were accepted as war measures, and the manner in which industry rushed to the support of the government will be regarded as one of the great achievements of the war.

Woodrow Wilson doubtless will be known in history as the man who stood for a world league to insure peace. His influence on finance and industry will seem insignificant in comparison with his importance as an international figure, but had not war imposed on him more important duties, his business legislation would have stood out as a remarkable achievement in itself.

Ore Output Registers Progress

THE wealth the Lake Superior iron ore district has contributed to the industrial welfare of the United States is the impressive feature of the shipping records of the mines, increased year after year with huge tonnages. Official reports compiled by IRON TRADE REVIEW reveal 60,780,000 tons of ore was poured out to the blast furnaces in 1923, the largest amount of any one year since wartime necessities prevailed. The district supplied approximately 85 per cent of all the ore used in the manufacture of pig iron in the United States; the total is fairly representative of normal conditions, and it may now be said that 60,000,000 tons represents an average season's output, rather than 55,000,000 tons, generally accepted as the standard a few years ago.

The shipping record of last year brings the grand total to 1,134,525,937 tons, and of this 1,002,837,027 tons falls within the span of the past 25 years. Within a generation the Lake Superior district has provided the country with more than enough ore to produce a half billion tons of pig iron, the mainstay of the country's manufacturing strength. It is interesting to note that in the same period the output of pig iron has been 645,622,996 tons, and the relationship this tonnage bears to that of iron ore is approximately 65 per cent, substantially the same as shown by iron ore and pig iron production records considered separately for the year 1923.

The completion of a decade for which the ore records have been compiled affords opportunities for comparison on this basis, and in each succeeding period there are found to be large increases; but when the division is made in five-year periods, the shipping record of the last five

years is shown to be below that of the preceding five—236,746,668 tons as compared with 273,934,118 tons. This is the first time in which there has been a stepdown. The cause of this is the unusual production of the war period, and the consequent lessening of output in subsequent years.

One of the striking points about the ore record is that 15 mines of the United States Steel Corp.'s subsidiary shipped 24,580,148 tons of ore, or 40 per cent of the total amount forwarded from the district in 1923. Ore came from 210 mines in the Lake Superior district and the average output per mine was higher than during the year 1916 when shipments totaled 66,658,466 tons. In 1922 ore was shipped from 201 mines, and total was only 43,990,096, while with the operation of only nine additional mines in 1923 the output was increased to 60,000,000 tons.

The Hull-Rust pit of the Steel corporation, that shipped 4,474,326 tons in 1922, in 1923 increased the amount to 8,823,879 tons, exceeding all its previous records. Something more than the mere scooping of the ore from the earth is required to obtain such remarkable results; and that is development and organization. The Lake Superior mining organization as a whole is as efficient in its functioning as any branch of the American iron and steel industry.

Copper's Future Is Bright

COPPER prices sagged during January to 12.37½ cents the lowest since September, 1921, when the copper industry was just emerging from the 1920-21 depression. During 1923, copper was one of the least favored of metals in a price way, excepting for a short rise early in the year. Its average price of about 14.421 cents in 1923 was less than the average for the prewar decade. Facilitated in part, however, by relative cheapness copper consumption last year reached the largest peacetime tonnage.

Domestic shipments in 1923 are estimated by producers at 735,000 tons; export shipments at 421,900 tons, or about 36½ per cent of American refinery production for the year. In prewar years export shipments always exceeded domestic shipments. During the three years prior to 1915, domestic shipments average 390,203 tons and export shipments averaged 403,613 tons. In other words, domestic shipments in 1923 were nearly 100 per cent greater than the average for the three years before the war, while export shipments in 1923 were approximately the same as the prewar average. If European consumption had increased in anything like the same ratio as American consumption has expanded, the world's producing and manufacturing facilities would have been inadequate to take care of all requirements for all countries last year. Meanwhile, the trend of copper prices continues to be influenced strongly by the state of affairs abroad. In November copper prices declined, due to reduced German buying when that country's currency reached bottom, but a recovery soon ensued, for French and Italian buying took up the German slack. In January, anxiety was aroused by the drop in French exchange and copper prices tumbled harder than ever, only to rebound, for it now develops that substantial German economic recovery is under way. German copper consumption has more than doubled in recent weeks and continental consumption in general has been remarkable. Consequently, and despite a cumbersome production, the copper industry is taking heart.

Applying X-Ray Examination to Steel

EXAMINATION of iron and steel by X-rays thus far has extended little beyond the research laboratory. In other words, with few exceptions, the method has not been applied commercially. Reasons for the apparent reluctance to adopt the method are not hard to find; many details are yet to be worked out by experimentation and the equipment is expensive. Therefore, it was with no little interest that members of the American Society for Steel Treating, holding their winter meeting at Rochester, N. Y., last week, listened to a paper presented by Dr. Ancel St. John, an authority on the use of X-rays for the study of metals.

One of the most interesting features of this paper was a glimpse of large scale work being done at the Watertown arsenal. By means of a high capacity X-ray apparatus, a number of heavy cast steel ordnance castings have been examined. For obvious reasons castings of this class must combine maximum strength with minimum weight, thus the X-ray was suggested as a means to locate interior defects. The results were surprising. Some castings were found to contain so many blowholes and gas pockets as to render the parts unserviceable. Naturally, attention was turned to molding and pouring methods with the ultimate outcome that by changing the gating and location of risers in the mold, almost perfect castings were obtained.

Probably the Watertown arsenal is one of the first to make practical application on the newer method of examination but its success points the way to more extensive commercial use. One argument in favor of the X-ray is that iron and steel found defective in its raw or semifinished condition can be discarded immediately before finishing operations are commenced. The saving to industry in the elimination of useless work is beyond estimation, and other benefits of examination by X-ray may be discovered.

Year's Pension Payments Largest on Record

The United States Steel and Carnegie pension fund which is applicable to the employes of the United States Steel Corp. and its subsidiary companies, disbursed $1,448,112.84 during 1923. This is the largest amount paid in any one year by the pension fund and compares with $1,266,661.74 in 1922. The number of pensioners added during 1923 was 576, while 408 discontinuances occurred. The total number at the close of the year was 4054. The average age of pensioners is 66.39 years and the average length of service 31.60 years. The average monthly pension is $26.90. The total paid out from the fund since it was established Jan. 1, 1911, is $9,543,235.33.

Principal disbursements in 1923 for individual companies were as follows: Carnegie Steel Co., $367,459.09; American Steel & Wire Co., $261,263.28; American Sheet & Tin Plate Co., $196,223.61; National Tube Co., $143,031.73; H. C. Frick Coke Co., $103,838.39; American Bridge Co., $105,416.46; Illinois Steel Co., $85,652.50; Oliver Iron Mining Co., $71,473.68; Tennessee Coal Iron & Railroad Co., $18,821.95.

Malleable Output Drops

Washington, Feb. 5.—December output of malleable castings, totaling 49,724 tons, was the lowest monthly production since the department of commerce commenced compiling these figures in May 1923. Operations were at 46.5 per cent of capacity in December, with 126 companies reporting, as compared with 49.1 per cent in November with 125 companies listed and 67.7 per cent in June when but 109 companies made returns. Comparisons of production, bookings and monthly capacity since May 1923, are as follows:

	Total tons produced	Per cent of capacity	Total tons booked	Monthly capacity
May	64,726	71	52,898	91,174
June	63,168	67.7	42,067	96,240
July	57,881	58.9	41,723	98,241
August	68,069	66.0	39,830	103,068
September	60,930	59.9	38,636	101,750
October	62,238	59.9	48,621	103,837
November	52,727	49.1	37,231	107,350
December	49,724	46.5	45,012	106,825

Sheet Plant Is Sold

Announcement is made by James A. Campbell, president of the Youngstown Sheet & Tube Co. of the sale of the Empire plant at Niles, O., to Jacob D. Waddell. This plant contains seven sheet mills. It was part of the holdings of the Brier Hill Steel Co., taken over by the Youngstown Sheet & Tube Co. a year ago. This sale will reduce the sheet mills of this company to 35. Mr. Waddell until recently was president of the Mahoning Valley Steel Co. at Niles, O., and now is a director. He has made no announcement of what he will do with the old Empire plant.

A report is current that the Youngstown Sheet & Tube Co. will also dispose of the Western Reserve plant of the Brier Hill Steel Co. at Warren, O.

Farm Implement Outlook Reported Improving

Chicago, Feb. 5.—As a part of its reorganization the Moline Plow Co. is to discontinue the manufacture of harvesters and tractors and to return to the manufacture of small farm implements. The tractor plant at Rock Island, Ill., and the harvester plant at Poughkeepsie, N. Y., are to be sold. All connections with automobile manufacture also are to be severed.

Announcement has been made by the Advance-Rumley Co. that it has taken over the business of the Aultman & Taylor Machinery Co., Mansfield, O. The Aultman & Taylor line of machinery is to be continued but will be distributed by the Advance-Rumely organization.

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American Steam Pump Co. Purchases Competitior

American Steam Pump Co., Battle Creek, Mich., has purchased the plant, assets and business of the Advance Pump & Compressor Co., that city. At the time of the purchase, the American company increased its capital stock from $500,000 to $1,000,000, giving its stockholders a stock dividend of 68 per cent. The balance of the increase being used in the purchase of the Advance company's properties.

The American company was incorporated July 2, 1873, under the name of the Battle Creek Machinery Co. The purpose of the original company was to manufacture and sell woodworking machinery. In 1888 the company began the manufacture of a patent pump, the inventor of which was Elon Marsh who recently died in Los Angeles. In 1894 the name of the company was changed from the Battle Creek Machinery Co. to the Battle Creek Steam Pump Co. and five years later in September, 1899, th epresent name style was adopted.

The capital was increased at various times from the beginning of $25,000 to $500,000—the majority of which increase has been given to the original stockholders in stock dividends.

For many years the company manufactured a line of centrifugal pumps and through the recent acquisition of the Advance company's line they now have a greater variety. The purchase has given the American Steam Pump Co. an additional floor space of 50,000 square feet.

The Advance Pump & Compressor Co. has dissolved and all business in the future will be carried on by and under the name of the American Steam Pump Co.

The officers of the American Steam Pump Co. will remain the same as in the past; Richard R. Hicks, president and treasurer; John W. Bailey, vice president; Walter R. Munn, secretary and traffic manager; Arthur Greene, assistant treasurer; and M. C. Abbey, superintendent.

Inland Reports Earnings

Earnings of the Inland Steel Co., Chicago, for 1923 from operations after administration, repairs, and maintenance were $7,399,364. The net profits after all expenses, including taxes, were $5,274,958. The company declared the regular quarterly dividend of $0.625 payable March 1, and a dividend of $1.75 on the first preferred stock payable March 15.

The Business Trend

February 7, 1924

BY JOHN W. HILL, FINANCIAL EDITOR

FEBRUARY has opened auspiciously. Constructive events continue to crowd upon the scene. Trade is not uniformly good but the industrial structure is strengthening at numerous salient points.

Evidence of this is found in higher commodity prices, rising grain values, expanding iron and steel operations and increasing freight traffic. Carloadings, which had dropped, made a new record for the week in the third week of January.

Wheat has had an impressive advance in the face of financial stress which has laid low 490 banks in the Northwest. Strength is derived from small marketings of grain and from plans of the government to extend aid to the distressed sections.

A most striking movement has been the swift upswing of British sterling. This is explained by the passing of the hysteria over the advent of the labor government, the settlement of the railroad strike and the recognition of Russia.

Europe Outlook Better

Moreover the entire European outlook is brightening. The expert financial committees are expected to evolve a solution for Europe's ills, which stark necessity will compel the nations to accept. Meanwhile Germany has sensationally wiped out its internal debts.

Of overshadowing domestic interest has been the favorable last quarter report of the United States Steel Corp. accompanied by an extra dividend of 50 cents a share on common stock.

The dividend signifies two things. One is the deep-rooted faith in the outlook held by the world's foremost industrial organization. The other is the fact that, despite high costs, profitable times at last, have returned for the steel industry.

Quarter Earnings Higher

Earnings in the last quarter were the highest since the war year of 1918. They were the largest in the peace time history of the corporation. The year's earnings gained 77 per cent over those for 1922.

The common stock of the corporation is now on an annual rate of 7 per cent. In 23 years of its life the company has paid out $1,155,000,000 to stockholders and expended $1,125,000,000 for improvements.

The stock market felt the stimulus of the extra dividend. Since October, when the corporation declared an extra of 25 cents a share, stocks have recovered 80 per cent of the ground lost from the 1923 high point. Decision of the house ways and means committee to reduce 1923 income taxes by 25 per cent has been cheering.

The Barometer of Business

Weekly Composite

	Last week	Week before	One mo. ago	One year ago	1913
Business failures..	474	491	414	434	...
Cash ratio Fed. Res. System, %.	81.3	80.4	73.8	76.9	...
Loan rate, 4-6 mo. N. Y. %.....	4¾	4¾	5¾-5	4¾	4½
Aver. 25 indust'l shares	$114.14	$114.39	$110.64	$115.03	$58.19
Aver. 25 railroad shares	$61.24	$60.60	$58.98	$65.28	$82.90
Aver. 40 bonds....	$78.55	$78.56	$77.15	$78.45	$93.00
Car loadings, week ended Jan. 19....	895,276	872,265	899,522	864,297	*804,866
Bank debits, 246 cities (000 omitted)	$9,524,757	$9,767,083	$804,866	$9,334,820	.....

*1920.

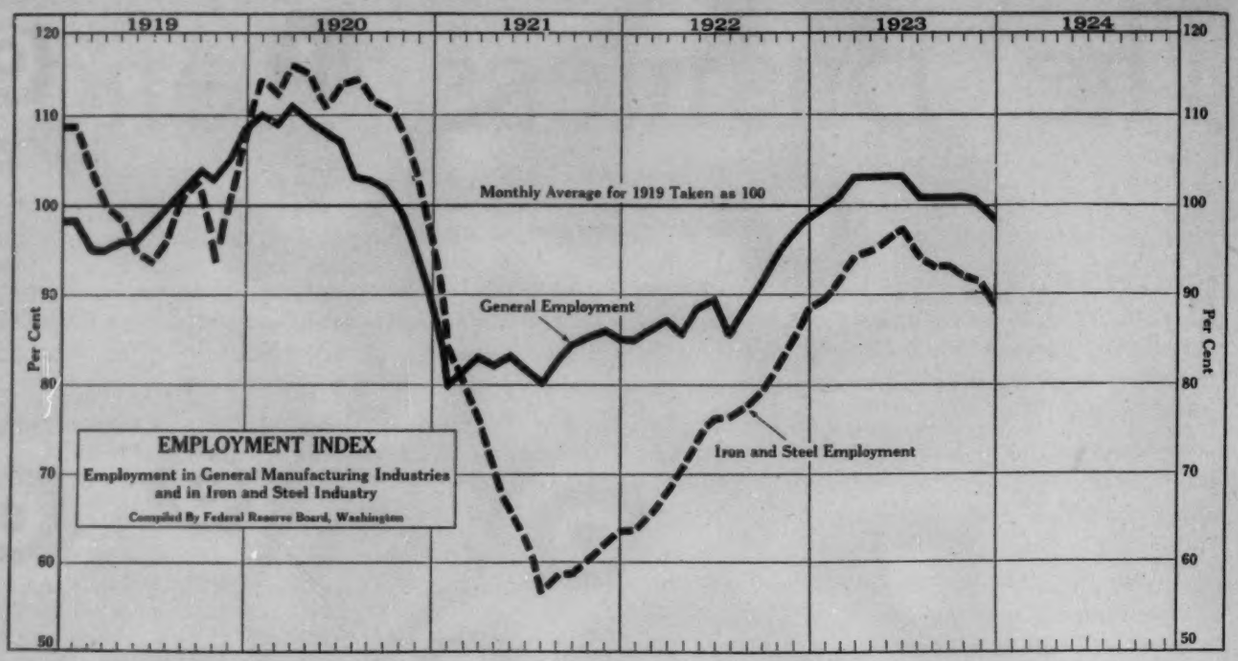
Foreign Exchange (Demand)

	Normal	Last week close	One week before	One month ako	One year ago
Sterling	$4.86	$4.35	$4.23	$4.29	$4.68
Francs	19.3c	4.70c	4.52c	4.93c	6.49c
Lira	19.3c	4.38c	4.34c	4.30c	4.95c

Monthly Comparison

	December	Month before	Year ago	Mo. average 1913
Dodge Building awards in 27 states (sq. ft.)	48,096,300	52,599,500	38,931,300	31,250,000
Business failures: Number	1843	1704	1814	1336
Liabilities ...	$42,705,000	$50,291,000	$58,000,000	$22,732,000
Exports	$425,000,000	$400,000,000	$344,327,000	$233,195,000
Excess of gold imports	$31,929,697	$39,011,000	$23,730,000	†$630,716
Bureau of labor price index...	151	152	156	100
Bradstreet's price index	144.7	145.4	148.2	100
Economist's British price index	168.5	167.1	156	100
Cost of living index	165	165.3	156	100
New incorporations	$955,632,000	$909,693,000	$913,901,000	$172,131,000
Railroad net earnings	*$86,130,000	$102,746,000	$78,860,000	$59,301,000

†Excess of gold exports. *November.

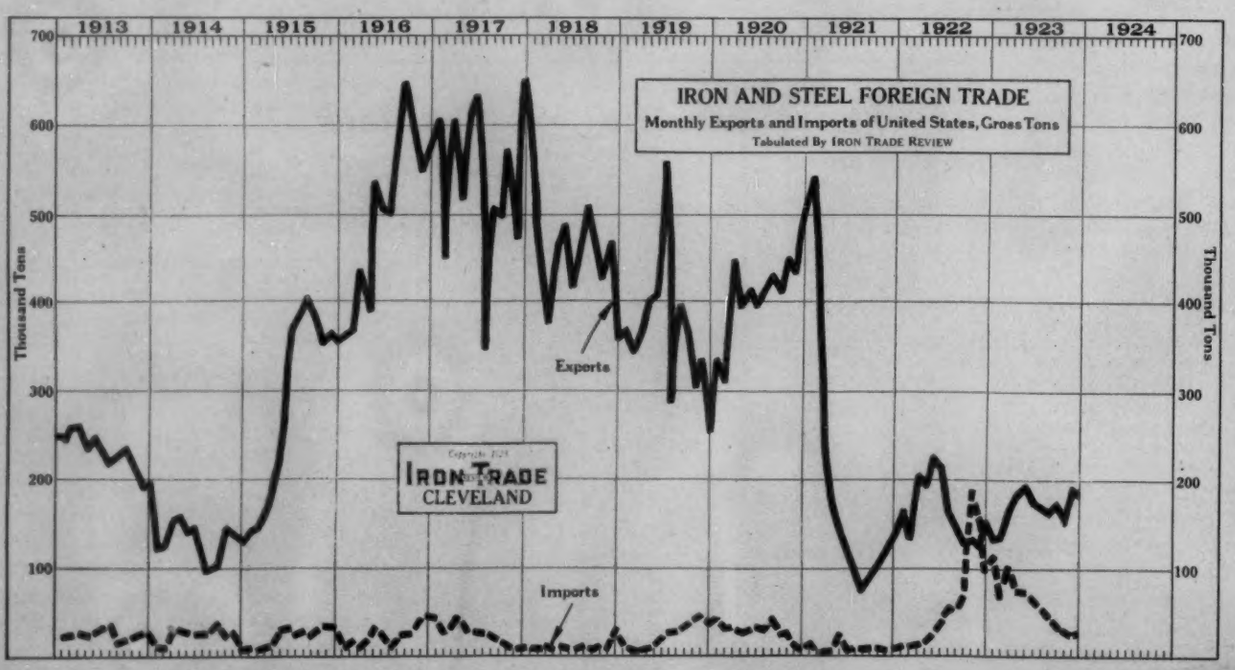


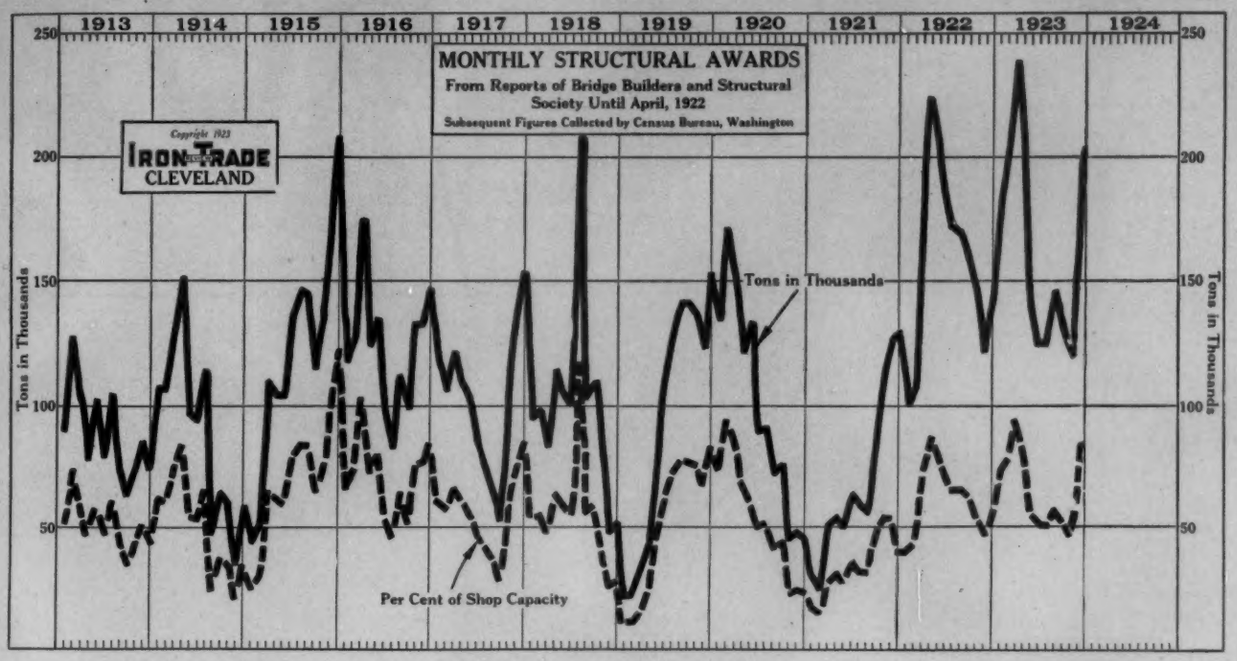
Employment Index

THE year closed with a slight decline in employment. This is in contrast with one year before when employment continued to climb through the year-end. Iron and steel employment as compiled by the federal reserve board at Washington, dropped to 89 per cent of the 1919 average. This was slightly higher than the 88 per cent of December 1922. It was the highest for any December since 1920. General employment went to 99 per cent of 1919 average. It stood, at the close of the year, at the lowest level in over a year.

Iron and Steel Foreign Trade

EXPORTS of iron and steel products in 1923 were 11 per cent ahead of 1922. With that exception they were smaller than any other year since 1914. Imports gained 4 per cent over 1922 and were the largest in the history of the country. The year's total exports amounted to 2,034,786 tons while imports were 733,776 tons. Monthly average exports in 1923 were 25 per cent below the 1913 average. The monthly average for imports in 1923 was 131 per cent over 1913. December exports dropped and imports gained.



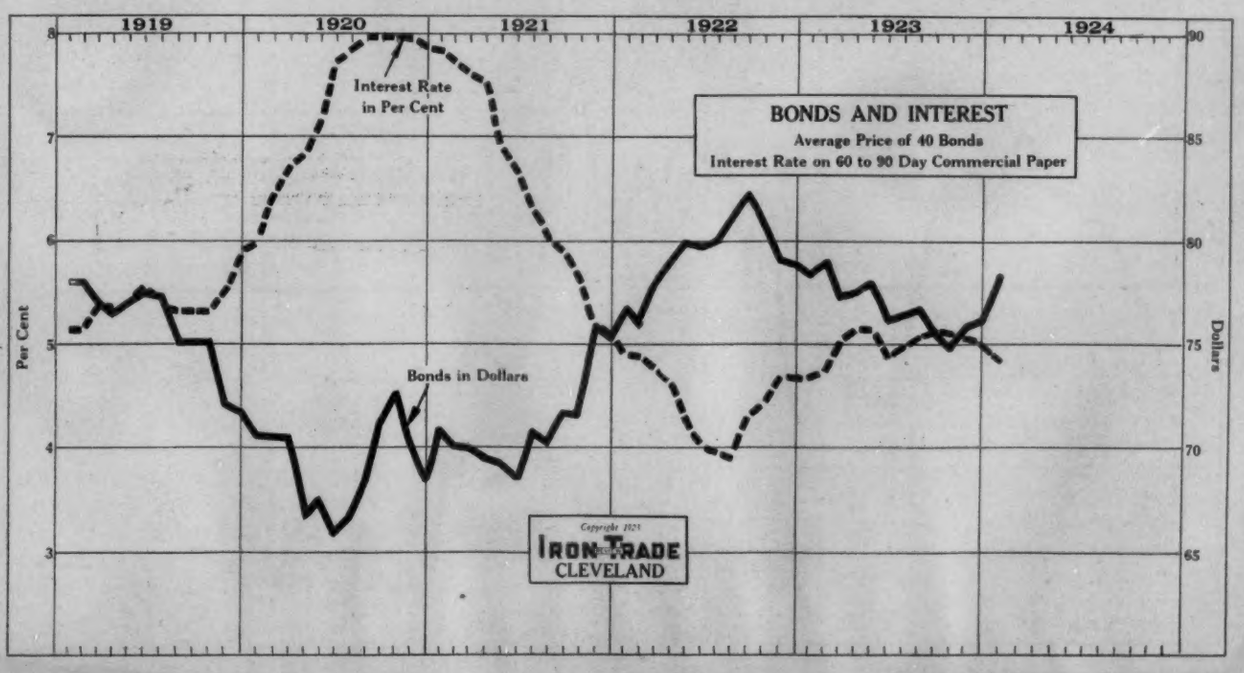


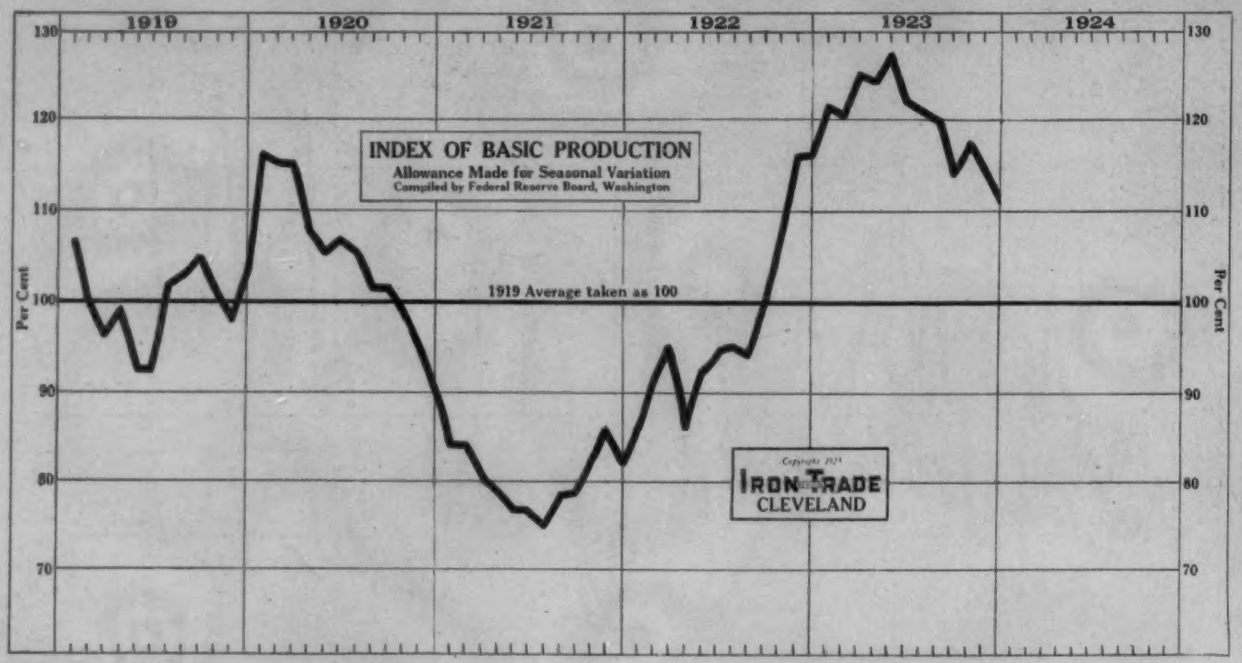
Structural Awards

THE diagram depicts the sharp recovery which has occurred in sales of fabricated structural steel. A spring of active construction activities is forecast. In December sales totaled 205,500 tons or 81 per cent of the capacity of the country's shops. This was the highest level for orders since last March. In December 1922 the bookings amounted to 150,000 or 60 per cent of the estimated shop capacity. During 1923 the structural sales averaged 64.5 per cent of capacity of the country's shop capacity.

Bonds and Interest

THE most spectacular event of the new year has been the rapid mounting of banking reserves and the sharp easing of money rates. During January commercial paper rates have fallen to 4¾ per cent from the higher level of 5¼ per cent last autumn. Lessened demand for credit, with continued heavy gold imports have enormously augmented banking reserves. The cash ratio of the federal reserve system has risen to 81.6 per cent, the highest point sinc eMay, 1917. Lower money has stimulated the rise of bonds.



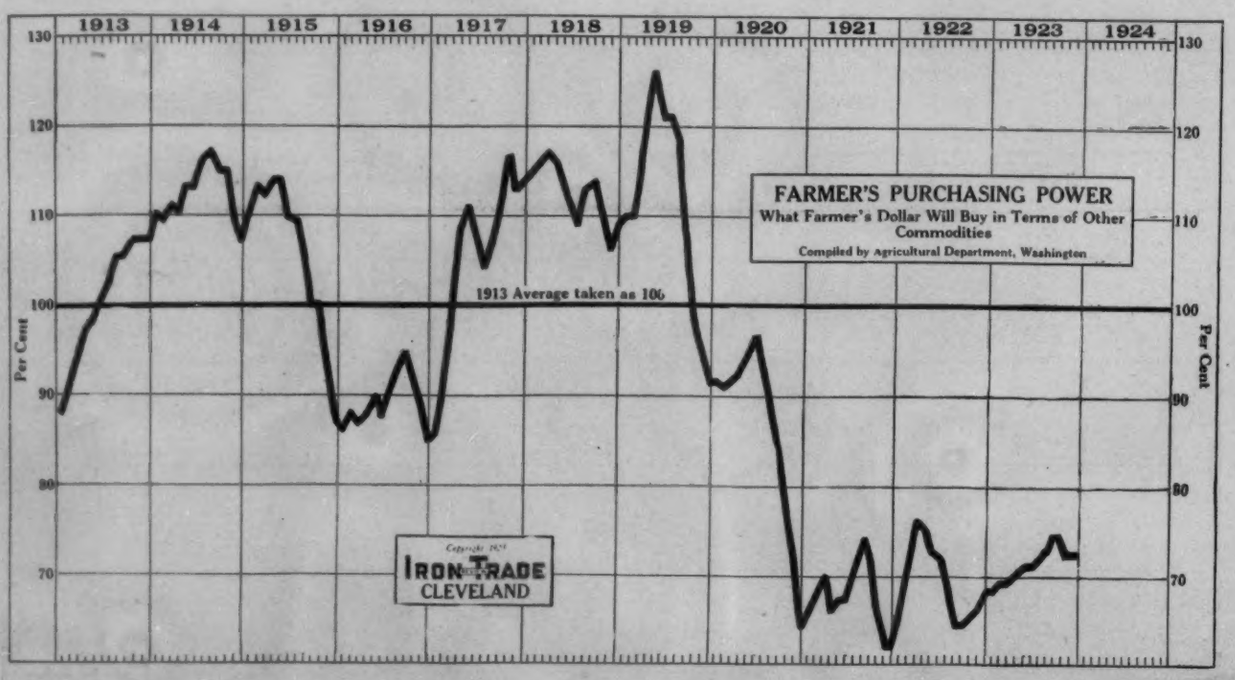


Index of Basic Production

THE index of basic production, compiled by the federal reserve board, declined 4 per cent in December to the lowest point of the year. The month's decrease reflected a large reduction of cotton consumption, and also lower activities in iron and steel, woolen, petroleum, sugar, and lumber industries. Part of the decline was seasonal and part of it was in continuation of the recession which began last spring. The situation has stiffened considerably since the first of the year.

Farmers Purchasing Power

THE purchasing power of farm products in December at 73 per cent of 1913 was the highest of any December since 1919. The increase over one year ago was 8 per cent. During the closing weeks of 1923 weakness appeared in live stock and in grain. Corn and wheat scored market advances in January. Prices for farm products are now only 4 per cent below the level for all wholesale values compared with 1921 when farm products were 20 per cent below the general level.



HEAT TREATING—
Its Principles and Applications

BY CHARLES H. FULTON, HUGH M. HENTON AND JAMES H. KNAPP

Chapter V—Normalizing and Annealing (Continued)

IN THE last installment the normalizing of 0.26 per cent carbon cast steel in half-inch cubes was explained and illustrated. The accompanying discussion pertains to the annealing of similar specimens, which process may proceed along identical lines as far as heating and holding at a fixed temperature are concerned.

The principal difference is that the cooling shall be sufficiently slow to allow formation of pearlite with excess ferrite. The object is to obtain maximum softness and ductility rather than strength. With the microscope low powers show the general arrangement of the constituents well, but as before, high powers are necessary to identify pearlite in doubtful cases. Fig. 36 shows the process for 0.26 per cent carbon cast steel, the same material as used in Fig. 34. Samples of this series were introduced without preliminary heating into the furnace at the temperatures indicated, held 20 minutes and cooled slowly in the furnace with gradually lowered temperature The specimens shown in Fig. 37 were given this treatment twice.

The structure in the "as cast" specimen needs no explanation, it being the same as in Fig. 34. The structure at 790 degrees Cent. (1454) is changed but little from that of the "as cast" sample. The structure of the 845-degree (1554)* specimen indicates that the ferrite has been given a better chance to start going into solution with the pearlite, and then, on precipitation with cooling, to be more or less heterogeneously mixed with the pearlite next formed. The illustration shows the ferrite soft and ductile as in the original, but arranged in a slightly better relation to the areas of pearlite. The grain size is smaller and the patches of pearlite more numerous, as compared with the brittle, coarse structure as cast.

Not until 900 degrees Cent. (1652) is reached does anywhere near enough energy or solution pressure develop to dissolve the whole of the ferrite on heating. The structure has a finer grain, the ferrite and pearlite are better situated for softness without brittleness and under a higher power of magnification a more distinctly laminated pearlite structure is revealed than in the case of the previously mentioned specimen. The photomicrograph of the material at 955 degrees Cent. (1752) indicates a slight tendency toward the structure of the cast specimen. This is better shown in the sample at 1035 degrees Cent.

*Numbers in parenthesis indicate temperatures in Fahrenheit.

Annealing Forged and Cast Steels

EFFECT of annealing from various temperatures on the structure of steel is discussed in the accompanying installment, which is the second of Chapter V. The effect on physical properties will be treated in the next article appearing Feb. 21.

Chapter I of the series appeared Oct. 4; Chapter II was published in the issues of Oct. 18, Nov. 1 and Nov. 15; Chapter III in the issues of Nov. 29, Dec. 13 and Dec. 27; and Chapter IV in the issue of Jan. 10. Chapter V began in the issue of Jan. 24.

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(1895) and is still more clearly indicated in the corresponding illustration in Fig. 37, in which the grain appears to be almost as large and the combination almost as brittle as in the original casting. A grain count under higher magnification shows a minimum size of grain (about 4000 per square millimeter) for the treatment twice applied at 900 degrees Cent. as illustrated in Fig. 37. This is in sharp contrast with the 10,000 grains per square millimeter in the specimen normalized from the same temperature. It will not be found possible to produce a grain of this kind in similar manner with pieces larger than one-half inch, but this grain is very good for 0.26 carbon steel.

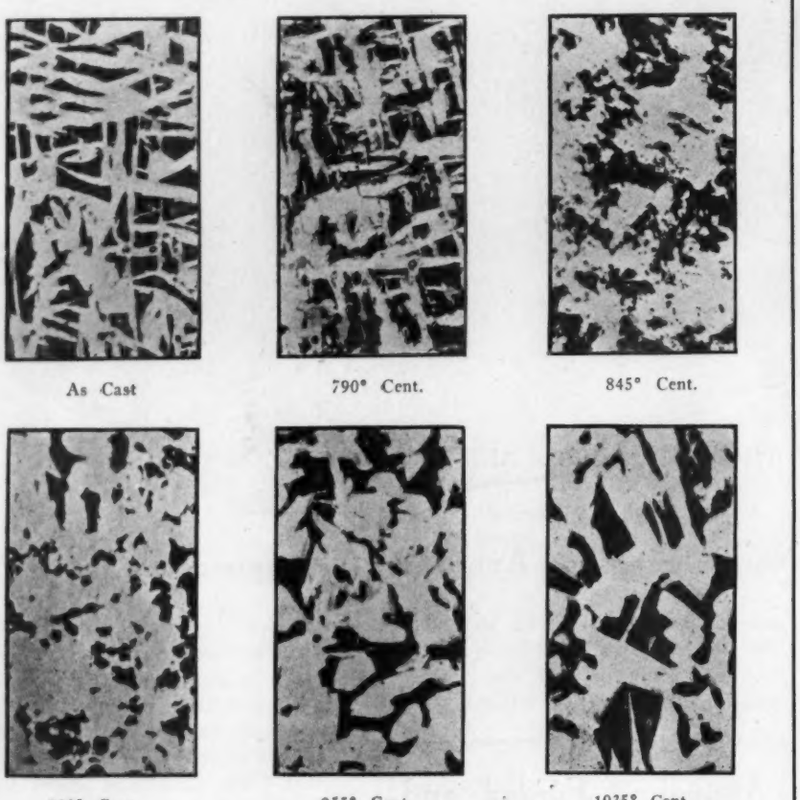


FIG. 36—STRUCTURE OF CAST STEEL CONTAINING 0.26 PER CENT CARBON, ANNEALED. PIECES PLACED IN FURNACES AT TEMPERATURES SHOWN, HELD FOR 20 MINUTES, AND THEN COOLED IN FURNACE

X100 *E. B. Zimmer, American Steel Foundries*

With cast steels of higher carbon, the annealing is carried on in much the same manner, having due regard for the change in the position of the critical range, i.e., the lowering of the correct holding temperature. It is the relative number of degrees above the critical range which determine the fast grain growth temperature for each particular carbon constant. Another point is the narrowing of the critical range as the carbon content increases. Air-cooling is harsher with higher carbon steels, hence normalizing will have a greater effect upon structure, by catching the new-born sorbite grains at the pearlite transformation and preventing the larger growth of all grains. Annealing must take a slower cooling to accomplish maximum softening. This is distinctly noticeable from 0.50 per cent carbon to 0.90 per cent carbon and obvious with still higher carbon.

Forged steel may be normalized or annealed, if work done upon it has been finished at abnormally high temperatures, by using a shorter time than cast steel (ordinarily) and at a somewhat lower temperature. When forgings are finished too low, or when a further machining is necessary, annealing or equiaxing of the ferrite can be accomplished at a temperature below the critical range. The pearlite or sorbite portion is *not* thus annealed. Below the critical, this so-called "works-anneal" takes a temperature which is lower the more cold work has been put into the forging. By cold work we mean work below the Ar_1 line. Severely cold-worked pieces should not be carried above 525 degrees Cent. (977) for "works-anneal" as ferrite growth is too great, due to the increased tendency of the amorphous iron, mechanically produced, to return to the crystalline.

If the pearlite in a cold-worked steel is to be equiaxed and recrystallized, the normalizing or annealing heat must be carried a certain small number of degrees above the critical point. "Small number of degrees," to make it plain that the cold work upon even the pearlite has caused a strained condition which tends to lower the recrystallization temperature.

Tool stock must be annealed or normalized at a temperature high enough to completely diffuse the microconstituents. Since the material is valuable extra care is important. The center of the range of temperatures for this material is 800 degrees Cent. (1472) for 0.5 per cent carbon; 740 degrees Cent. (1364) for 0.90 carbon; and 900 degrees Cent. (1652) for 1.30 per cent carbon. Slow heating and cautious cooling are necessary. For machining a treatment often is best which is intermediate between normalizing and annealing, because the softest surface does not always give the chip from the lathe tool which makes for fast and clean work.

Forged tools are not always left in an ideal condition, and hardened tools often need annealing and rehardening. Small thin parts are tender due to the great surface exposed. Therefore, the thin sections and not the larger sections of the same tools should receive the greatest attention. Tools already cooled rapidly enough to retain martensite or troosite forms of solid solution are in reality hardened excessively. The mechanism of the hardening process will be explained in detail in Chapter VI.

Double Heat Treating

In the first step of the so-called "double treatment," the advantage is taken of the hardening process because it *holds* the fine-grained structure in the solid solution form after pains have been taken to accomplish the refining. In the second step all the hardness is released by reheating, keeping the temperature safely *below* the critical. The higher the reheating temperature (below the critical) the more ductile the product, without sacrificing the strength due to small grain size. Lower temperatures, in the neighborhood of 500 degrees Cent. (932) give more of the tensile strength of the solid solution from quenching, at a sacrifice of some ductility. Elasticity and resistance to abrasion also here result, akin to that obtained in the single step normalizing of small pieces.

Hypereutectoid steel for spheroidizing is accorded a double treatment in which both steps are varied much from the foregoing. Here severe quenching leads to cracks, and besides, all that is necessary is to have *some* free cementite at the grain boundaries and in the needles to start the spheroidizing later. Consequently the first step is cooling just rapidly enough, probably in an air blast,

to produce this free cementite in a matrix of sorbite. The second step consists of reheating and holding a long time just below the lower critical range. Cold-worked tools and hypereutectoid specimens seem to spheroidize more readily than others, but also degenerate more readily into the graphite pearlite form if the heating is not surely uniform and continuously below the critical temperature.

Purpose of Spheroidizing

Spheroidizing, as the name implies, means the collection of cementite into small spheroids or globules in a ground mass of ferrite. As all iron-carbide tends to assume finally the elemental state of ferrite and graphite, so cementite tends to withdraw from the eutectoid structure. Just why the start should be in the free cementite is not clear, but some peculiar "oil on water" tendency causes it to draw up into small particles, first at the boundaries of the pearlite patches, then at the needles which separate the individual pearlite granulations.

The tendency soon spreads to the pearlite itself and the "divorcing"* of the cementite from the ferrite in pearlite leaves the structure with soft ferrite for ductility and malleability, cementite for hardness and wear, and usually a none too great element of strength, generally not essential in the class of articles for which spheroidizing steel is used.

According to Belaiew, the Damascus blades of old were spheroidized hypereutectoid steels carefully worked at a temperature just below the critical. Globules on pearlite boundary, in needle, in pearlite plate, all were drawn out to fill the pattern of larger figures from the original cast dendritic form.

A peculiar problem sometimes comes up in annealing screw stock. The slag and phosphide bands prevent grain growth unless broken up; therefore, miscellaneous stock of this kind should be hot-worked all it will stand, finishing at a low temperature, after which annealing will be possible, and with a reasonable time and at a temperature depending upon carbon content.

The effect of normalizing and annealing from various temperatures having been discussed, the next logical subject is the influence of temperature on the physical properties of the steel. This will be fully discussed in the next installment.

Installation of mechanical doublers and shears for 30 hot mills at the Shenango works, New Castle, Pa. and for 20 hot mills at the Farrel works of the American Sheet & Tin Plate Co., Farrell, Pa. now is being undertaken. Last year Nos. 1 to 10 hot mills at the Sabraton works of the company at Morgantown, W. Va. were equipped with mechanical doublers.

*H. M. Howe, "Metallography of Steel and Cast Iron," p. 393.

Bids Opened for Third Largest Bridge

A cablegram from Australia reports that the bids of the McClintic-Marshall Co. and the Canadian Bridge Co., for constructing the bridge across Sydney harbor have been rejected, the award to go to Dorman, Long & Co., of England, or Sir William Arrol. The bids were taken on about 75,000 tons of steel work, and the latter two interests bid about £5,500,000.

The bridge is to be the third largest steel structure of its kind in the world, and the successful bidder will be required to erect a fabricating shop in New South Wales. Tenders were taken on two types of bridges, cantilever and arch. The cantilever plan embraces a main span of 1600 feet in the clear, and a length of main bridge of 2600 feet. The total length of the main bridge and approach spans is specified as 3810 feet.

The alternative plan specifies a main span of 1650 feet, and a total length of main bridge and approach spans of 3770 feet. Either bridge is to provide for four lines of railway, six lines of vehicular traffic and footway accommodation. The lowest point of the center span is to be 170 feet above high water level. The bridge costing around $30,000,000 when complete is intended to open and develop new territory, now reached by means of ferryboats.

Publish New Standards

The fifteenth edition of the standards of the Electric Power club, 900 B. F. Keith building, Cleveland, now is ready for distribution. New sections have been added for standards pertaining to electric drills and reamers, electric arc welding machines, storage batteries for mining and industrial locomotives and synchronous motors. Abbreviations and symbols for use in wiring diagrams, definitions relating to power switchboards and oil circuit breakers and standard and preferred transformer ratings are presented. Rules have been added to sections applying to motors of various kinds, generators, mining and industrial locomotives, industrial control equipment, power switchboards, oil circuit breakers, other switching equipment, buffers and grinders.

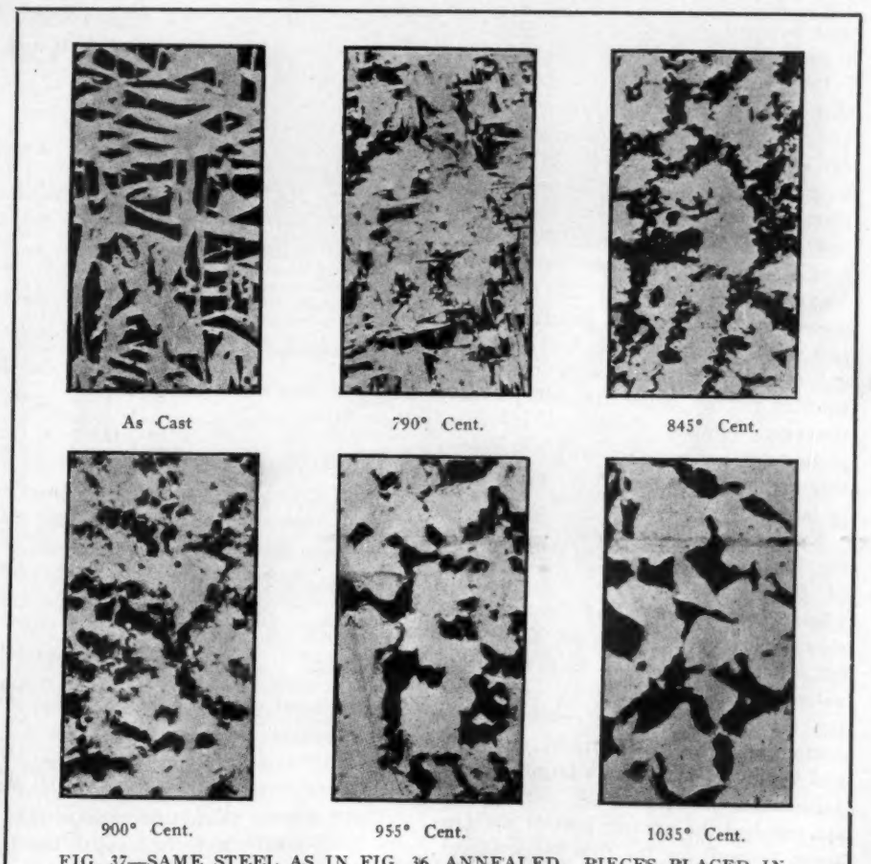


FIG. 37—SAME STEEL AS IN FIG. 36, ANNEALED. PIECES PLACED IN FURNACE AT TEMPERATURES SHOWN, HELD FOR 20 MINUTES, COOLED IN FURNACE, AND THEN THESE OPERATIONS REPEATED

X100 *E. B. Zimmer, American Steel Foundries*

Japan Becomes Our Best Market

Steel Requirements for the Next 15 or 20 Years Will Be Supplied Largely by American Manufacturers—Increased Buying Expected at Beginning of Fiscal Year in April—A Summary of Opportunities

BY LUTHER BECKER

FOR the past few months Japan has been the one bright spot in our international export trade for iron and steel products, resulting primarily from the urgent need of construction materials for sheltering the homeless in the earthquake areas.

Beginning in November, 1923, when rush deliveries of American black sheets and wire nails for Japanese private account got underway, with a total volume of steel of all descriptions of 54,281 gross tons, the movement was further augmented in December when the aggregate tonnage reached 78,588 tons. Shipments of a portion of the order placed by the Japanese government direct with American mills for black and galvanized sheets and wire nails accounted for the larger December export tonnage. January should see the completion of this contract with volume of shipments for this month correspondingly large.

Export shipments of steel goods to the Japanese market for the entire year of 1923 were, however, disappointing when a comparison is made with the previous year, or 363,668 tons as against 602,281 tons, a loss of 38 per cent in volume. This poor showing for American steel mills was the result of keen competition from the British, Belgians and Germans, who won a large share of Japan's purchases in 1923. Great Britain supplied the greater part of the Japanese demand for the thin black sheets, which are galvanized in local plants, and much of the tin plate used in the petroleum and fishing industries. Belgium and Germany participated largely in the heavier items of steel such as bars, shapes and wire rods. Canada was a factor in Japan's 1923 wire rod buying.

America Contributes Much

The year 1923 was not normal with respect to Japan's purchase of steel rails. American rails, heavy and light, comprising 65, 75 and 100-pound rails for the imperial government railway, and 60-pound sections down to 8-pound for privately owned and industrial railways, have been in demand now for a number of years and our share in this trade usually runs well over 100,000 tons a year. In addition to this the imperial government steelworks at Yawata supplies each year a fairly large tonnage of rails to the home market, particularly to the government owned lines.

The following table shows in detail America's contribution in gross tons to the Japanese demand for iron and steel in the closing two months of 1923 and the full year:

	Nov.	Dec.	Full year
Pig iron	.....	.....	87
Scrap	6	559	8,670
Ingots, blooms, etc.	.....	.....	844
Iron and steel bars	2,323	797	7,177
Alloy steel bars	8	2	66
Wire rods	7,214	5,328	26,070
Plates	168	174	1,307
Galvanized sheets	1,008	3,533	8,848
Black steel sheets	13,770	33,348	74,758
Black iron sheets	46	50	469
Hoops, bands, strip steel	15	45	955
Tin plate, terne plate, etc.	3,142	8,217	37,933
Structural shapes, plain material	1,408	1,130	6,752
Structural materials, fabricated	3,393	1,066	12,715
Metal lath	54	36	124
Steel rails	10,684	12,097	91,718
Rail fastenings, etc.	1,196	1,464	8,476
Boiler tubes, welded pipe	1,735	2,452	29,099
Cast iron pipe fittings	11	8	265
Malleable iron pipe fittings	53	24	452
Plain wire	2,408	3,171	23,825
Barbed wire, woven wire fencing	110	.....	268
Other wire and manufactures	83	44	850
Wire nails	5,183	4,712	19,449
Other nails, including tacks	15	77	282
Bolts, nuts, rivets and washers, except track	11	77	642
Car wheels and axles	183	81	1,230
Iron castings	37	47	196
Steel castings	4	12	24
Forgings	13	37	117
Total	54,281	78,588	363,668

The Japanese market demands a thinner black steel sheet than any other in the world, a most difficult specification for a sheet mill to roll. The thickness of the sheet is determined by the specification, which requires 13 or 27 sheets per bundle of 112 or 224 pounds, 3 x 6 feet in size. The equivalent in Birmingham gage is about 31½. A normal year's supply for Japan of this specification may run as large as 150,000 tons. The United States and Great Britain combined shipped to Japan in 1923 a total of 248,000 tons of black sheets, the major portion of which represented this specification.

The bulk of these sheets are galvanized in the many galvanizing plants that sprung up during and since the world war, and the sheets are used in building construction, for roofing and siding, either as corrugated or flat sheets, for signboards, cups, dippers and utensils of all kinds.

Japan consumes about 100,000 tons of tin plate each year, and the specification against which purchases are made are many and exacting. By far the greatest volume is used in the petroleum industry which allocates its purchases among the leading Japanese import houses with branches at New York and London. The remainder is consumed in the canning industry centered at Hakodata where crab and salmon are brought in small steamers from Kamchatka, and in the making of toys, food and tobacco containers.

Britain Supplies Tin Plate

The British tin plate mills supplied the Japanese market in 1923 with 37,648 tons or only a couple hundred tons less than our own contribution during the same period. The figures would indicate that Great Britain is gradually regaining its position of first rank in the tin plate trade of Japan, which it had enjoyed for many years before the war. The Japanese have been known to favor the American brands and to pay a slight premium in price for them.

In welded gas and water pipe Japan presents a rich field for American manufacturers. Certain American brands are by-words among the Japanese who call for them on every occasion. The Japanese importer and dealer appreciating the popularity of the American article carries large stocks in central localities from where they are distributed to all parts of the empire. The Japanese specification for black and galvanized pipe calls for English standard weights, English threads and couplings, and in random lengths of 16 to 18 feet. British official statistics show shipments of wrought pipe and fittings to Japan in December, 1923, of 75 tons, and for the full year 2779 tons.

Japan offers a good opportunity for the sale of an American steel product, wire rods, which are imported for the further manufacture or drawing down in local factories into plain wire which is used as such, or for the making of wire nails and wire rope. The Japanese have made rapid strides in the manufacture of wire rope. A common Japanese specification calls for open-hearth steel wire rods, No. 5 W. B. gage, carbon content 0.06 to 0.12 per cent, in catch-weight bundles, unwrapped. In spite of the purchase of large quantities of

(*Concluded on page* 422)

The author is chief of the iron and steel division, department of commerce.

Outwitting the Safe-Breaker

By the Use of Alloy and Special Steels Impervious to Attack by the Cutting Torch Engineers Have Succeeded in Building Bank Vaults Which Are Impregnable — Special Machine Tools and Accurate Finishing of the Work Play an Important Part

BY HERBERT R. SIMONDS

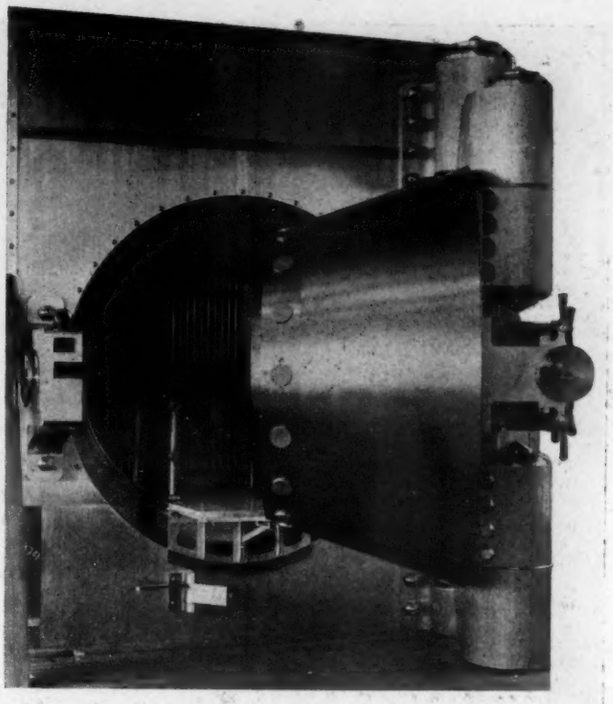


Fig. 1—Main entrance to vault of the Federal Reserve Bank of Cleveland. Assembled, the door weighs over 100 tons

ADVANCES in science, while usually employed in hastening the progress of civilization, unfortunately also increase the power of destruction when placed in the hands of those who work against society. This conflict between the constructive and destructive employment of the fruits of science is afforded full play in modern warfare, but it also exists in many peacetime pursuits. One of the most interesting examples of this latter phase of the conflict is shown in the art of building safes and vaults for the protection of gold and valuable documents.

Years ago case hardened steel vaults were built to prevent the destructive use of drills in the hands of safe-breakers. The development of tool steel cutters made the protection thus afforded inadequate and safe-builders next turned to manganese steel, and other hard alloys. In an endeavor to find means for rapidly cutting steel engineers perfected the oxyacetylene torch and today great masses of tangled steel framework resulting from a fire may be removed with these torches in a small fraction of the time required before their introduction. On the other hand, the same engineers who helped in this work unwittingly played into the hands of safe-breakers.

The author is associate editor at Boston of IRON TRADE REVIEW.

The modern oxyacetylene torch and equipment is the most efficient tool ever placed in the hands of a bank robber. Some time was required after the torch was in general use in industry for the thieving profession to discover its usefulness, but once it had been successfully employed in a safe theft, the news traveled rapidly and almost over night safes which had been thought burglar proof were considered highly pregnable. Safe and vault manufacturers immediately started the work of combating this new enemy.

Science has again triumphed and the present day bank vault provides adequate protection not only against

FIG. 2—ONE END OF THE MAIN MACHINE SHOP. IT IS USED ALSO AS THE ERECTING FLOOR. A ROW OF LARGE BORING MILLS AND OTHER HEAVY-DUTY MACHINE TOOLS FOR FINISHING DOORS AND DOOR FRAMES IS SHOWN AT THE RIGHT

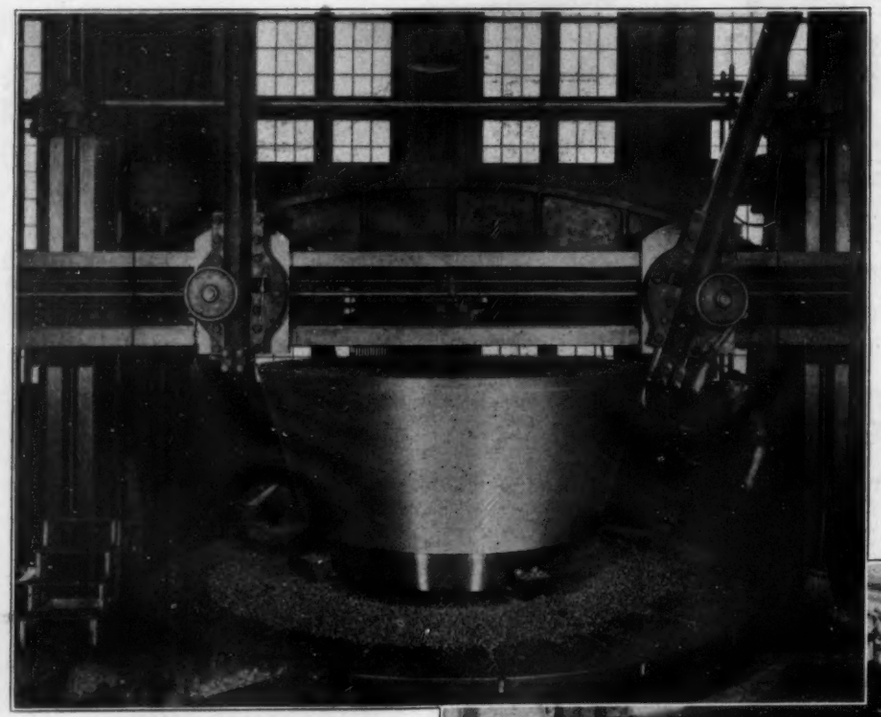


Fig. 3—In finishing the conical door casting two cuts were taken simultaneously, one a finishing cut down the side of the door and the other a cut across the upper face. The final finish is obtained with abrasive wheels.

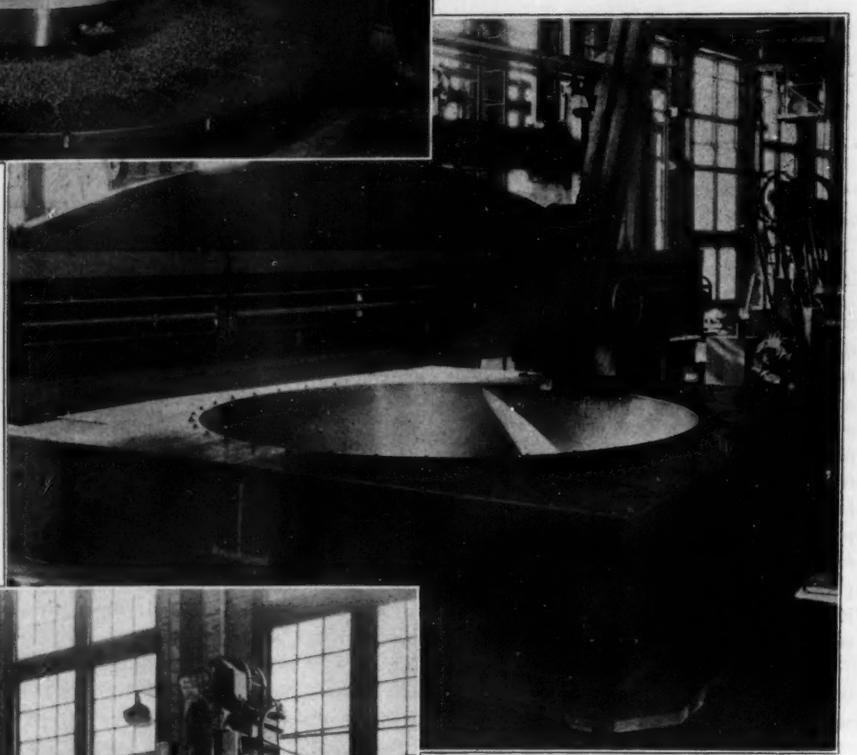


Fig. 5—A large boring mill machines the inside surface of the door frame casting which is mounted to revolve on the bed of the machine. The plate bolted on top of the casting is a guide for the tool head.

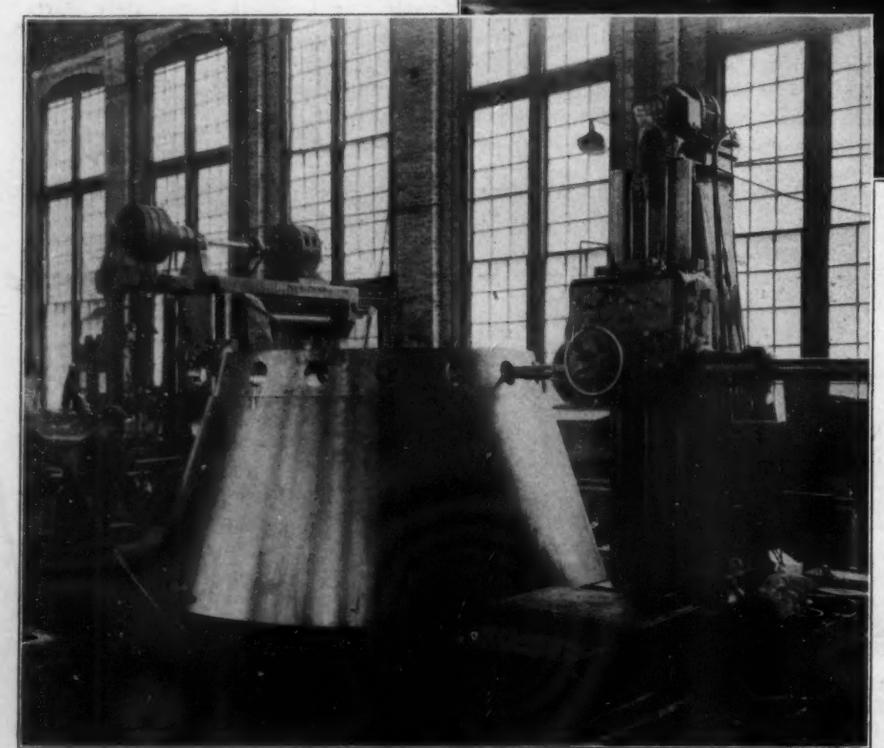


Fig. 4—When the finishing cuts have been made as shown in Fig. 3 the door casting is placed on a boring machine and the holes for the locking bolts are drilled. These holes must be spaced accurately.

known destructive elements, but also anticipates conjectural destructive agents of the future. The bank burglar works at disadvantage in his attempts in gaining entrance to any vault. The mechanics who build the vaults have at their command labor saving tools and appliances which facilitates the rapid execution of their work. They work in the open without fear and with no limitations placed on the noise or commotion which they may make. The blacksmith swinging his sledge upon the red hot iron in a manufacturing plant obviously strikes a heavier and more effective blow than the burglar swinging a sledge against a bank vault in the early hours of the morning under the constant fear of detection.

Bank Vaults Burglar Proof

Properly built bank vaults at the present time are burglar proof. During recent years no door of burglar proof construction has been attacked, to say nothing of being opened. The absence of attack is the virtual admission by the burglar that the strength of the steel structure is beyond his capacity to destroy. Unfortunately the public has been misled in its judgment of the vulnerability of bank vaults by reports of the burglarizing of light safes designed for fire protection only. Vaults are much alike in the public mind and the report of the failure of one is apt to condemn the character of others.

Perhaps it is not generally known that there is a well established profession of vault engineering. Engineers engaged in this work co-operate with bank architects and with safe manufacturers in the development of suitable protective equipment. Many problems other than protection against burglary are involved. A modern vault is designed to withstand the effects of fire, earthquake, and even bombing and, in addition, is made as nearly proof as possible against accident in its daily operation. A vault in a large bank must combine protective features with convenience in its use. The floor should be on the same level as the main bank floor. This means that for the type of door shown in Fig. 1 a section of the floor is removable to permit the opening and closing of the door. When it is desired to open the door in this particular installation, a floor panel in front of the door is lowered much as an elevator floor descends and after the door has been fully opened this panel is raised into position.

Hinge Friction Reduced

Mechanical means for closing a vault door are considered dangerous because of the liability of their operation while attendants are in the vault. For this reason thousands of dollars are spent in reducing the hinge friction so that massive doors may be closed and opened by hand. Recently an entirely new principle in door construction has been brought out by vault engineers. Instead of a door being hinged from the outside of the vault it is built in the form of a large vertical cylinder with a rectangular slot like a keyway extending horizontally through its center. When this cylinder is turned, so that the slot extends from the interior to the exterior of the vault, the slot forms a means of entrance and exit. When the cylinder is turned through 90 degrees, however, the slot is completely concealed and the heavy cylinder walls become a formidable door of double thickness.

Building Large Vaults

The usual type of door, of course, is that which is hung on vertical hinges placed outside of the vault at the right of the door opening. Fig. 1 shows such a door and is the largest ever built. The door itself weights over 200,000 pounds and is over 4 feet thick. This vault was built by the York Safe & Lock Co. for the Federal Reserve bank of Cleveland. Vaults of this type are built in a great variety of sizes and their production has led to the development of large manufacturing plants, the plant of the York Safe & Lock Co. at York, Pa., being typical of the industry. This plant, while making nearly all sizes of safes, specializes in large bank safes and vaults, and for this reason much of its equipment is of special design and many of its machine operations are of unusual interest.

One end of the main machine shop is shown in Fig. 2. This shop which is served by five electric traveling cranes

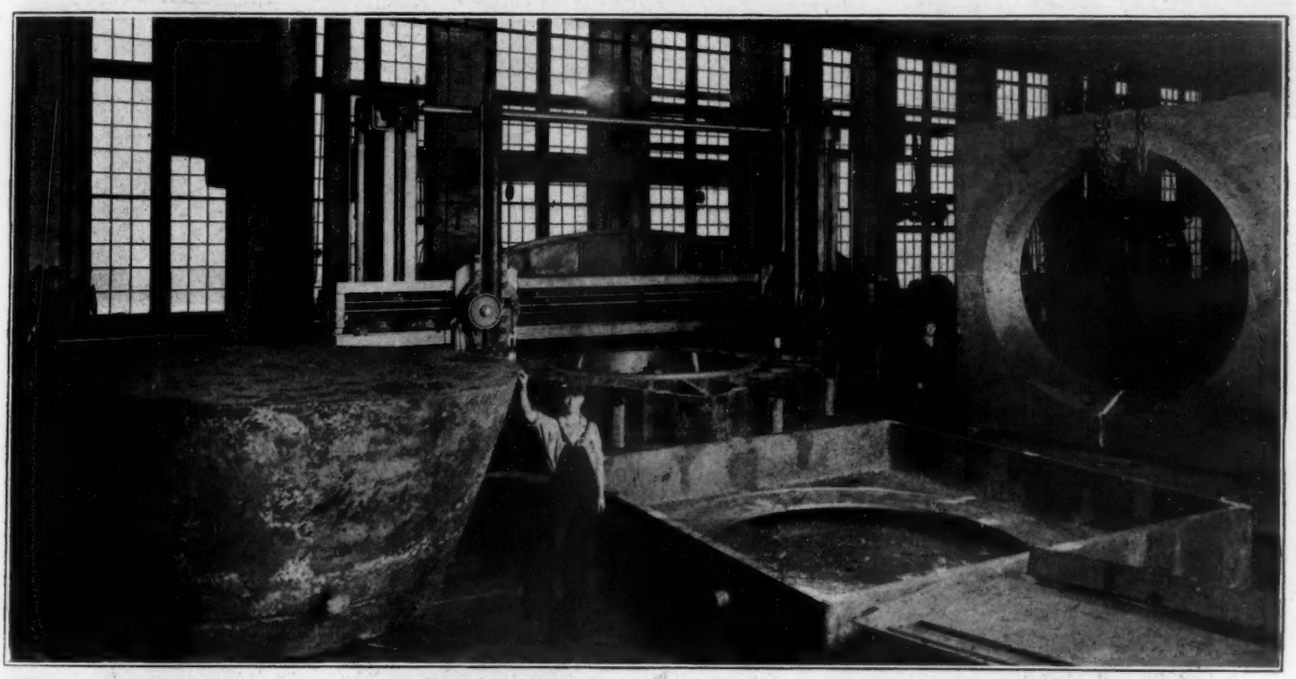


FIG. 6—THIS SHOWS THE FOUR CASTINGS WHICH WERE USED TO CONSTRUCT THE LARGEST VAULT DOOR EVER BUILT. THIS VAULT WAS INSTALLED IN TH E FEDERAL RESERVE BANK OF CLEVELAND

FIG. 7 (ABOVE)—ONE END OF THE SMALL WORK MACHINE SHOP. HINGE PINS, BOLTS, BEARING AND LOCKING MEMBERS ARE MADE HERE. FIG. 8—(CENTER)—A STANDARD GAGE SPUR TRACK RUNS THROUGH THE MAIN MACHINE SHOP. A LARGE PLANER IS SHOWN IN THE RIGHT FOREGROUND. FIG. 9 (BELOW) SMALL LOCKS AND SAFETY DEPOSIT BOXES ARE MADE IN THIS DEPARTMENT. HERE THE MACHINING, FITTING AND ASSEMBLING OPERATIONS ARE SUBJECT TO FREQUENT INSPECTION. GOOD NATURAL LIGHTING IS ESSENTIAL FOR THIS WORK

is used in part as an erecting floor. At the right in the photograph is a row of large boring mills and other heavy duty machine tools and, at the left, assembling operations are in progress. Fig. 7 shows the shop which is devoted to light machine work, the equipment consisting of shapers, light planers, lathes, and milling machines. It is here that hinge pins, bolts, bearings and locking members are made. Fig. 8 shows another view of the main machine shop and is the end opposite that shown in Fig. 2. At the right is shown a large planer at work on four vault door frames which are placed end to end on the planer bed.

To facilitate the handling of heavy work and the loading of freight cars, a standard gage siding has been constructed directly across the main shop floor. A car is shown on this siding in the illustration. Cars may be run in onto the shop floor and the shop doors closed and in this way they are protected from the weather and may be carefully loaded with the assistance of the shop cranes.

Fig. 10 is a view of the plate and sheet department. Here vault sides and the laminated structures for doors are built up. The company does not make the time locking devices which it uses, but it does make up safety deposit box locks. The shop devoted to this work is shown in Fig. 9.

Building the Cleveland Door

As the door is usually the most vulnerable point of a vault, its construction requires the most attention and is of chief interest. As stated previously the Cleveland vault door is 48 inches thick and weighs over 200,000 pounds. Some of the castings required in the construction of the door and door frame are shown in Fig. 6. The main door casting is shown at the left. It is hollow, is machined both inside and out and is filled with plates made of steel and of special alloys. The door frame is made from the three castings shown at the right. These castings combined weigh 143,000 pounds and they also are filled with plate laminations.

As the door is circular most of the machining can be done by mounting the casting so as to revolve on the bed of a large boring mill. Such an operation is shown in Fig. 5. This shows the machining of the inner surface of the outer door frame casting. The plate shown bolted on top of the casting serves as a guide for the tool head. After taking a roughing cut and a finishing cut, the tool head is changed to a motor-driven abrasive wheel which is traversed at the proper angle across the machined surface. This produces the accurate finish which is required.

A door casting is machined in much the same way as the door frame casting. In Fig. 3 two cuts are being taken simultaneously, one a finishing cut down the side of the door and the other a cut across the upper face. For both of these surfaces the final finish is with abrasive wheels. The size of the door casting and of the machine tool on which it is mounted may be readily judged from the relative size of the operator who stands on the rotating machine bed. After completing the finishing cuts shown in Fig. 3 the door casting is placed on the boring machine shown in Fig. 4, where the holes for the locking bolts are drilled.

In order to swing a 200,000-pound door, a massive hinge is required. The main casting for this hinge weighs 40,760 pounds and is 17 feet 6 inches in overall height. The complete mechanism as assembled weighs 47 tons and is thought to be the largest hinge ever built. The design of bearings for this hinge and the accurate machining are such that one man can swing the heavy door. The principle of roller bearings is utilized but in addition large alloy crown washers are used to reduce the contact surface. Machine work in connection with the hinge pieces follows the general practice adopted on the other large castings. The main hinge casting, however, was too large for the heavy duty planer shown in Fig. 8 and a special rigging had to be built up in connection with an open side planer. The fillets were finished with a milling machine and because of the width of the surface a cut had to be taken first from one side and then the whole casting was turned around and a cut from the other side taken.

Building Up the Laminations

Time is the most important factor making for the success or failure of the safe breaker when attacking a bank vault. The maximum of time at his command is from the closing of the bank on one day until the hour of its next opening, and the extreme limit based on the experience of years is placed at 64 hours, this coming only when a legal holiday precedes or succeeds a Sunday. Manufacturers of burglar proof vaults, therefore, are concerned with constructing a mechanism which will require a maximum amount of time to destroy. The chief element of resistance in a modern vault built by the York company, is found in the laminated structure of the door and door frame and vault walls.

As has been described, the door and its frame consist of heavy hollow castings which are later filled with plates of steel and special alloys. The casting, which is but a shell of relatively thin walls serves as a container for the materials which offer the chief resistance to a burglar's efforts at cutting. Details of lamination construction are maintained as trade secrets by their manufacturers. The York Safe & Lock Co. has developed a metal plate which looks much like a steel plate, but which is proof against the action of the oxyacetylene torch and other steel burning flames. The plates of this material are alternated with steel plates of various physical properties. These, built up into thicknesses varying from 1 foot to 4 feet and snugly inclosed in strong castings present such a formidable barrier to the burglar that a successful attempt at the theft of the contents of a vault which is so protected is almost beyond all human possibility.

FIG. 10—THE PLATE AND SHEET DEPARTMENT WHERE VAULT SIDES AND LAMINATED STRUCTURES FOR DOORS ARE BUILT UP

Appleton L. Clark has been appointed receiver of the Fowler Bottling Machine Co., 124-32 White street, New York. Liabilities are given at about $7000 and assets about $4000.

Is Display Room Worth While?

Possibility of Abandoning Expensive Stores and Conducting the Business from Offices Is Attracting Attention of Many Machine Tool Builders and Dealers—Declare Only 5 Per Cent of Sales Are From Floor

BY FRANK G. STEINEBACH

WHILE economy is being urged in all lines of manufacture and distribution, it is especially imperative that it be strictly enforced in the machine tool industry. The excess capacity of machine tool builders, coupled with the low demand caused largely by the abundance of wartime tools that have not yet been absorbed, has brought about a condition taxing the resourcefulness and ability of the keenest minds in the industry.

Consequently it is not surprising that in the past few years builders and dealers have sought methods of reducing costs. These efforts have extended to all parts of the business and while the operating departments in many cases have offered the most fertile fields for reducing expenses, the ax also has fallen on sales and distribution activities.

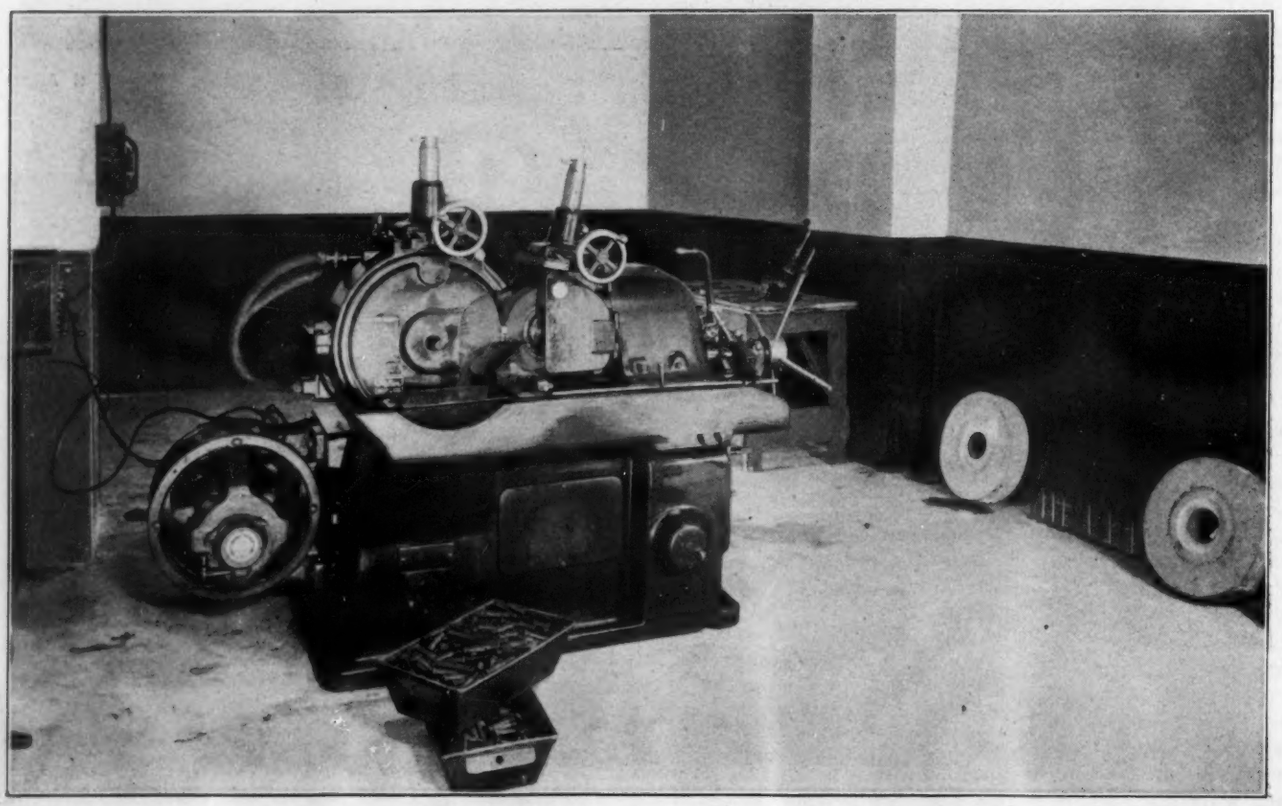
Machine tools are sold by manufacturers through local dealers, through branch offices of the manufacturer, or through a combination of these agencies. Therefore the cost of distribution is a vital factor to both dealer and manufacturer, regardless of the arrangement under which the tools are sold.

The author is editorial representative at Cleveland of IRON TRADE REVIEW.

For years it has been the practice of dealers to provide display rooms where tools of a wide range of models and sizes could be shown to prospective purchasers. In many cases the dealers also maintained warehouses where additional stocks were stored. When convenient, prospective customers were brought to the showroom where they were given an opportunity to examine the machines on the floor and where the salesman could explain the outstanding features of the machines. In a number of instances the display room was equipped with a line-shaft and motor making it possible to place a machine under belt so that its operation could be demonstrated for the benefit of prospective buyers.

Shortly after the war when the need of economy began to be felt, a number of dealers questioned the real value of display rooms and after considerable investigation a number of them gave up showrooms and conducted their business from offices. This practice has extended throughout the principal machine tool districts and within the past year the tendency to do without display rooms has been especially marked. The trend is toward a policy of giving up extensive show rooms and warehouses and conducting the business from offices usually in large buildings in the downtown business section.

As in the case of all departures from established custom, opinion is rather sharply divided as to the advisability of this policy. Dealers who already have given up display and warehouse space are firm in their conviction that the expense involved in maintaining large display space is not justified. On the other hand dealers who are continuing to use display rooms are positive that they are employing an effective method of merchandising machinery. Because of this



ROOM IN THE BASEMENT OF A CLEVELAND OFFICE BUILDING ARRANGED FOR THE USE OF ITS MACHINERY DEALER TENANTS FOR DEMONSTRATING MACHINE TOOLS TO PROSPECTIVE PURCHASERS

difference of opinion, and because of the significant trend away from display rooms that has taken place during the past year, a study of the factors involved should prove interesting.

The value of display rooms and warehouses should be considered in respect to the amount of assistance they render in the actual selling of tools. Are the majority of sales made after the customer has examined machines on the display floor, or are other methods more effective? This question can best be answered by those who have had many years of experience in selling machine tools.

Sales from Floor 5 Per Cent

One dealer, who has conducted a successful business for a number of years, declares that in his opinion 80 per cent of all new machine tools are sold after the buyer has seen only photographs, circular matter, or advertisements of the machine; that 15 per cent are sold after the machines are shown in actual operation in the shops of other purchasers; and that the remaining 5 per cent are sold directly from stocks on hand after the buyer has inspected the tools in warehouses or showrooms. This dealer points out that in most cases involving large sales of machinery, the salesman must conclude negotiations at the office of the prospective buyer through the aid of catalogs and photographs. In cases where a prospective buyer desires to see the machine in operation, the salesman usually can arrange to take him to a plant where one of the machines already has been installed. Other dealers believe that if the buyer is insistent on seeing the machine before he buys it, he will gain a much better impression from an operating machine in a manufacturer's plant than from a floor model or from a machine in warehouse stock.

On the other hand dealers who advocate the use of warehouses and display rooms declare that prompt shipments can be made from the floor, thus avoiding delays to the customer and thereby making sure of the business. However, not all dealers will agree that this argument is conclusive. One experienced distributor points out that where several lines of tools are carried the dealer must maintain a large warehouse if he expects to fill orders with machines from the floor. Even if the dealer could maintain a stock of tools of sufficient variety and number to assure prompt delivery out of stock, the expense involved in carrying such a large number of tools and the comparatively small turnover on the amount invested would wipe out all hope of a profit.

As an example of the variety of tools that must be carried to insure making deliveries from stock promptly, the case of lathes can be cited. As a rule a dealer carries the agency for three grades of lathes, one line of high grade or expensive machines, one of medium-priced models and one of the cheaper lines. Lathes of each class are made in various sizes, the swing of the chuck ranging from 9 to 36 inches, and the length of bed varying from 3 to 18 feet. While the character of lathes that must be carried in stock differs in various localities depending upon the type of manufacturing plants predominating in that territory, still a large assortment must be stocked, necessitating an exceptionally large number of machines. Lathes, however, constitute only one item of the stock that must be maintained. When it is realized that extensive assortments of drills, planers, grinders, hobbers, etc., also must be kept on hand, the magnitude of the investment necessary readily can be appreciated.

Therefore it is not surprising that many dealers have found it impossible to carry all of the heavy machines in stock. The time required for a complete turnover of machines in stock is estimated to be from six months to from two to three years. A number of distributors claim it would not be difficult to find tools that have stood on machinery store floors for five or six years.

In case a dealer has a large warehouse stocked with standard tools of the heavy type the turnover is so slow that the yearly return on the amount invested will not pay the operating expenses unless the dealer is operating on a high margin of profit. Some time ago a large machinery house in one of the principal distributing centers discontinued its large warehouse occupying practically a city block and in which was carried a $500,000 stock of machines. The change was made because the company found the warehouse stock a losing proposition.

It may be pointed out that a small dealer by carefully stocking only machines that can be turned over quickly, can reduce the number of machines and the investment required to a low figure. However, dealers who have tried this state that does not work out well. It seems that no matter what size or model of machine is carried in stock, something slightly different is desired by the customer. For instance if a dealer carries a few lathes in stock, the prospective customer is likely to want a machine having a bed of different length than any of those carried, or perhaps a lathe with the desired swing is not in stock. Again the accessories may not be the kind wanted by the buyer. As one dealer expressed it, no matter what size or model is carried in stock, in nearly all cases the buyer wants a tool that differs in some way from those on hand, making it necessary in the end to order from the factory.

Machines Become Obsolete

Since the sale of tools carried in stock must be extended over a period of time, the tendency is for machines on the floor to become obsolete, due to the changes in design that continually are being made by the builder. When a tool is superseded by one of improved design the dealer may be obliged to dispose of the remaining old machines at a sacrifice. Selling the machines after a new model has been brought out, even though the transaction is closed in good faith, is

Cutting the Cost of Distribution

IN NO branch of business is economy more urgent than in the machine tool industry. Manufacturers already have reduced costs in many departments, but attempts to lower the expense of distribution is complicated by the fact that in many cases builders and dealers must cooperate before savings can be effected.

If it is true, as one experienced dealer claims, that only 5 per cent of machine tool sales result from the inspection by buyers of tools exhibited in the dealers' display rooms, then the true value of the traditional "store and warehouse" method of selling bears investigation. Interviews with machinery builders and dealers in the principal distributing centers of the country indicate a majority opinion that the maintenance of large stocks on display and warehouse floors cannot be justified. This opinion is corroborated by the present marked tendency of dealers to abandon stores and to conduct their business from offices.

The author of the accompanying article discusses the many factors entering into this phase of the distribution of machine tools and equipment, basing his statements on information obtained from widely separated sources. The results of his investigation, while not conclusive for all conditions of selling, point strongly to the decision display rooms are not worth while. Dealers and manufacturers who still maintain display floors will do well to analyze the problem as it applies to their individual conditions with a view of determining whether or not they are overlooking an opportunity for reducing expenses.

likely to lead to complications in future dealings.

Changing demand also has its effect on warehouse stocks. The average general demand for the past 2½ years has inclined toward special machines, or standard machines modified or amplified to fit them for special work. Special machines cannot be carried in stock and as a rule the standard machines in stock are not readily convertible.

Uncertainty in the matter of holding agencies is an important factor in regulating the stock that is carried in the warehouse. A dealer may accept an agency and purchase tools for stock, after which he may fail to make enough sales to satisfy the manufacturer, in which case the agency may be shifted to another dealer. Unless the new agent is willing to take over the stock, the original dealer must sell at a loss. Manufacturers have been known to offer as an inducement to the new dealer the fact that improvements have been brought out on the machines, making obsolete the machines held by the first dealer. Only one solution remains for the agency problem. The builder and dealer must get together on a common basis, study the problems of the other, and arrive at a point of complete understanding.

Used Tools Included

It often has been stated that the used machinery dealer will find it impossible to conduct his business without the aid of a display room. In this connection it is claimed that the general practice is for the prospective buyer to shop around and attempt to secure the best machine at the lowest price. Generally speaking, this practice is confined to the users of small tools, and for the most part the buyer who calls at the display room of the second-hand machinery dealer is not in the market for tools of the larger type. A dealer in second-hand machinery maintaining a large display room recently stated that in the case of his company there is little value in keeping large tools on display. He declared that all of the profits from the sale of small tools and equipment is required to pay the overhead for the show room. This dealer believes that the used machinery dealer easily can conduct his business from offices, keeping a warehouse outside the high rent district for tools on hand. Dealers also are getting away from carrying large stocks and are conducting their sales efforts on the inspection plan. Machines are assembled at various points, sometimes held only by option on part payments, and prospective buyers are taken to see the machine, wherever it may be located. During the past year in Boston the Taylor Machinery Co. and the W. H. J. Fitzgerald & Co. gave up their display room and moved into office quarters. In Cleveland the Cleveland Duplex Machinery Co., the Kearney & Trecker Co. and the Motch & Merryweather Machinery Co. discontinued the use of show space in favor of offices. The Motch & Merryweather company continues to maintain a warehouse to take care of the second-hand machinery, but no new machinery will be added to the stock. William K. Stamets maintains a branch office in Cleveland, but has no display room. In Chicago two companies have made the same move.

Few dealers in the New York district maintain show rooms. Here industrial plants are situated so near together that it is convenient to show the prospective customer tools in operation in nearby plants. Dealers in this territory, however, have tried another system for maintaining display floor. In 1919 a machine tool exhibit intended to be a permanent affair, was established. The purpose was to afford foreign buyers better facilities for inspecting tools. Approximately 100 companies took space at this exhibit, of which 20 were machine tool sellers, the remaining companies being manufacturers of electrical equipment, conveying machinery, farm implements, etc. The project did not work out as expected and many of the tenants withdrew soon after it was started. Another exhibit was inaugurated later in another building, but the attempt collapsed after a short trial.

A number of dealers in the Pittsburgh district have been operating without display space for some time, among whom are the Brown & Zortman Machinery Co., the Laughlin Barney Machinery Co., William K. Stamets, and the Consolidated Machine Tool Co. The Motch & Merryweather Machinery Co. has a show room but carries no stock.

As has been stated above, where the prospective buyer wishes to see the machine, it usually is possible to take him to a plant where a machine of this type already is in operation. However, without display space and power connections, it is rather difficult for a dealer to show a machine of entirely new design until after one has been sold and placed in a plant. To supply a place for the machinery dealers in Cleveland to show machines, the owners of a building in which several machinery dealers have offices have fitted up a demonstration room in the basement. Dealers with offices in this building may secure the use of this room for demonstrating purposes. The room is large enough to accommodate a fairly large machine, and has the necessary power and water connections so that machines may be set up and placed in actual operation. A view of the room showing a centerless grinder, now being demonstrated by a Cleveland dealer, is shown in the accompanying illustration.

Japan Best Buyer

(*Concluded from Page* 414)

wire rods Japan still takes a large tonnage each year of plain wire, the receipts from the United States amounting to 23,825 tons in 1923, as against 26,070 tons of wire rods. The demand for plain wire comprises such descriptions as galvanized telegraph and telephone wire, which is largely purchased for the imperial Japanese government, and for which there are definite specifications to cover; piano wire, unbrella and spring wire, flat wire for clock springs, nail wire, and bright and galvanized wire.

American wire nails are preferred in Japan, as elsewhere in the world's markets, because of the quality of the steel which is used in their manufacture, and the method adopted for packing for export. The nail used throughout Japan is the counter-sunk checkered-head, packed in picul kegs of 133 1/3 pounds net each.

The year's total shipments to Japan of plain structural material, 6752 tons, and fabricated shapes, 12,715 tons, were not as large as formerly because the saturation point apparently was reached in building construction, though the catastrophe which visited the Tokyo-Yokohama section has changed all this. The permanent reconstruction program is expected to get under way with the advent of the next fiscal year, April 1, 1924, when active buying of both classes of materials will be resumed.

The Japanese Diet authorized the expenditure of 87,607,000 yen in this period for restoration of public works both in Tokyo and Yokohama and in surrounding prefectures, as well as for fire-prevention zones. The total amount to be expended for reconstruction work during the next five fiscal years is 468,438,849 yen, which sum the central government is authorized to borrow.

Reconstruction will not be hurried, but will be conducted in a systematic and efficient manner to insure the best that the Japanese can possibly obtain in the way of modern cities having wide streets, good roads, parks, canals, waterworks, sewage system, transportation facilities, warehouses, office and municipal buildings, hotels, etc. Japan should offer an attractive trading market for foreign manufaceurers of steel materials during the next 15 or 20 years.

Rigidity Sought in January Machines

PRESENT conditions in the machine tool business place a premium on the application of new and untried ideas. In developing new equipment embodying sharp departures from traditional design, a builder must be sure of his ground. Not only must the new product be correct from an engineering standpoint, but it must fulfill a definite requirement in the metalworking industry.

In view of this situation it is not surprising that of the several hundred new machine tools brought out by American manufacturers in the course of a year, less than a score possess notable features of design that are strictly new. On the other hand, few new models of high grade machine tools are offered which do not boast of improvements in at least one or more important details. In other words, while original ideas come to light occasionally, the existing conceptions of design constantly are being revised and improved.

This general rule is well illustrated in

(*Continued on Page* 425)

Deriving Greater Value From Machine Tool Descriptions

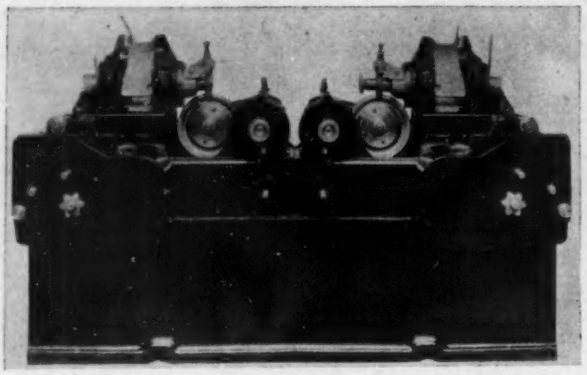
IN THIS issue IRON TRADE REVIEW *inaugurates a new method of handling descriptions of new machine tools and shop equipment. The change in policy was made after a careful study in which the interests of the readers of this publication and the manufacturers of machinery were taken into account. It is believed that under the new plan the descriptions and illustrations will prove to be of greater service to users of tools and shop equipment and that the manner of presentation will be appreciated by those who desire a concise, continuous record of the new machines developed from time to time.*

Many years ago IRON TRADE REVIEW, *as in the case of some of the other papers, scattered descriptions of new tools throughout each week's issue with little regard to arrangement. Later the articles were published consecutively in a fixed position in each number. This practice, while having advantages, left much to be desired.*

Beginning this week machine tools will be described in the first issue of each month. The name and address of the manufacturer, a brief statement of the principal features of the product, and a representative illustration, conforming to the style of the descriptions appearing on the following page, will be published. Each item will be given a number to facilitate identification in an index to be presented each month. The index will be carried forward monthly and appropriate cross references will be given to afford a continuous record of new tools.

It will be noted that each item (in a few cases two items) occupies a space of approximately 3½ x 5 inches and that the part of a page containing the description of a lathe, boring mill, grinding machine or other unit classified as a machine tool is backed by the description of a truck, vise, wrench or other product properly designated as shop equipment. This arrangement makes it possible for readers to clip the articles on either machine tools or shop equipment for pasting in scrap books or on index cards. It is believed this feature will appeal to many users of machine tools whose attempts to file information on new equipment heretofore have been discouraged by the necessity of mutilating unrelated reading matter when clipping the desired articles.

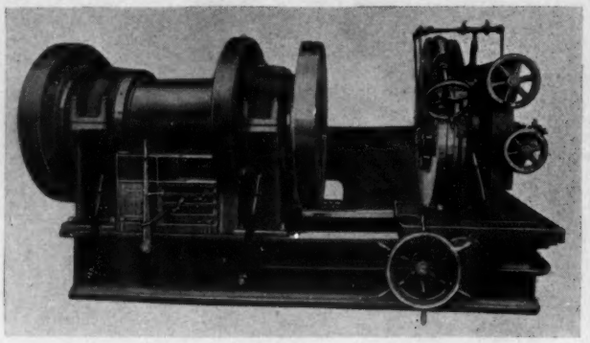
In adopting the new plan of presentation, IRON TRADE REVIEW *is cognizant of the fact that the space allotted each tool does not provide for sufficient text matter to adequately describe machines embodying radical or marked departures from conventional design or construction. In order to correct this condition, the monthly digest of new machine tools and shop equipment, which in this issue is presented above on this page, will be followed by such additional information as in the opinion of the editors is necessary to properly supplement the numbered descriptions. In this way readers not only are assured of an adequate reference to the worth-while new features of each piece of equipment, but are furnished a concise, interpretive analysis of the month's offerings.*



Grinds Gears Automatically

No. 1

The Fellows Gear Shaper Co., Springfield, Vt., recently has introduced a full automatic involute gear grinder. The machine automatically controls the rolling action of the gear against the surface of the grinder, indexes for each tooth, trues the flat surfaces of the grinding wheel and stops when the gear has been completed. The rolling head is light, oscillating on ball bearing supported trunnions mounted on the slide. The master involute tooth can be made accurate to within 0.0001 inch. A special device maintains constant pressure of the work against the grinding wheel. A small grinding wheel is used, a factor which governs the speed at which the machine can be operated. For grinding both sides of the teeth simultaneously the machine is made in pairs, right and left.



Designs Pipe Threading Machine

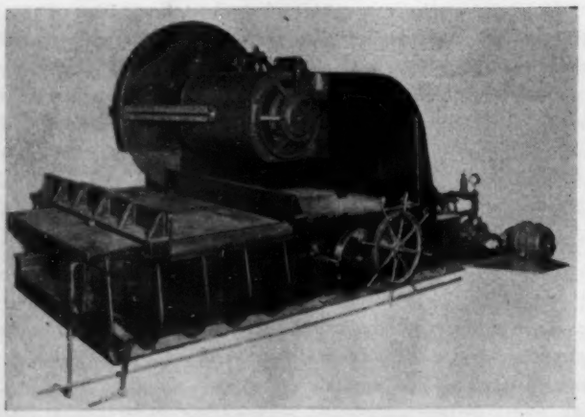
No. 3

The Landis Machine Co., Waynesboro, Pa., has recently developed a 20-inch pipe threading machine and cutting machine. The range is from 10 to 20 inches covered by one die head and one set of chasers. The length of the machine is 12 1/6 feet, the height is 6 feet and the extreme width with belt drive is 5 5/6 feet, and with motor drive 6 4/6 feet. The weight is 22,000 pounds. The machine has a single pulley drive, eight speed variations being obtained through a speed box beneath the main spindle. The operating cone of the clutch is moved by two levers near the operator, the forward lever being for starting and stopping when making up flanges and the middle lever for reversing. A three-jawed independent chuck at the end of the hollow spindle holds the pipe. The rear chuck is equipped with flange grips for fitting flanges.

Builds Heavy-Duty Friction Saw

No. 2

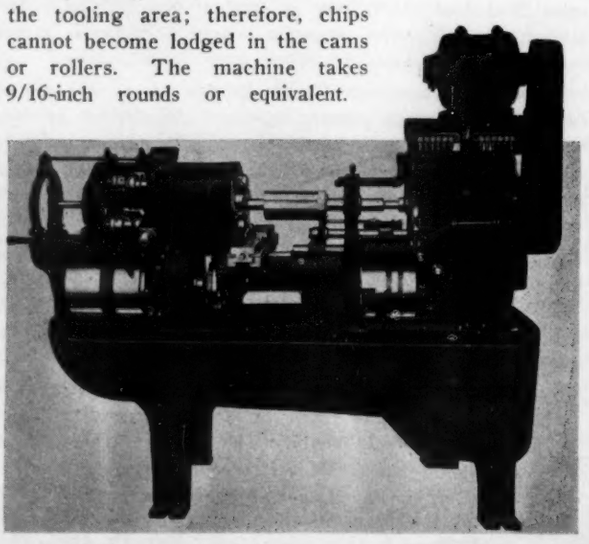
Joseph T. Ryerson & Sons, Inc., Chicago recently have added a heavy duty friction saw to their line of metal cutting machinery. The saw is driven by a 125-horsepower motor, takes a 61 x ⅜-inch blade and accommodates the maximum size of I-beams, channels, angles, tees and girder rails; 3½-inch squares; 4-inch rounds; or the equivalent of 30-inch, 180-pound girder beams with 13-inch flange. The rollers on the table facilitate the handling of heavy sections. Two levers mounted on the control box (not shown), situated where most convenient, control the operation of the saw. One governs the water supply and the other moves the saw in or out of the cutting table. The feeds are hand and hydroelectric automatic.



Automatic Has Five Spindles

No. 4

The National Acme Co., Cleveland, has developed a new 9/16-inch automatic screw machine having five stock carrying spindles instead of four as in earlier models. The machine is designed so that right hand tools are used exclusively, and the drums on the camshaft are well up under the bed so that the camming of feeds of the tool slide, indexing of cylinder and stockfeeding is accomplished by the direct application of rolls on the drums, avoiding the tendency of levers to spring. No operating mechanism is below the tooling area; therefore, chips cannot become lodged in the cams or rollers. The machine takes 9/16-inch rounds or equivalent.



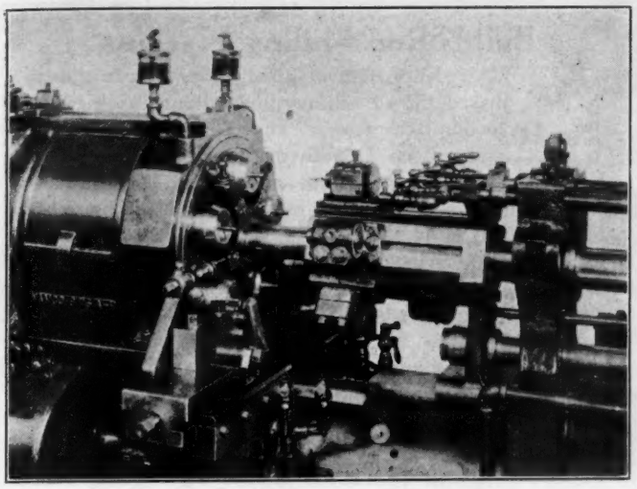


FIG. 1—CLOSE-UP OF 5-SPINDLE AUTOMATIC SHOWING DESIGN OF MAIN TOOL SLIDE

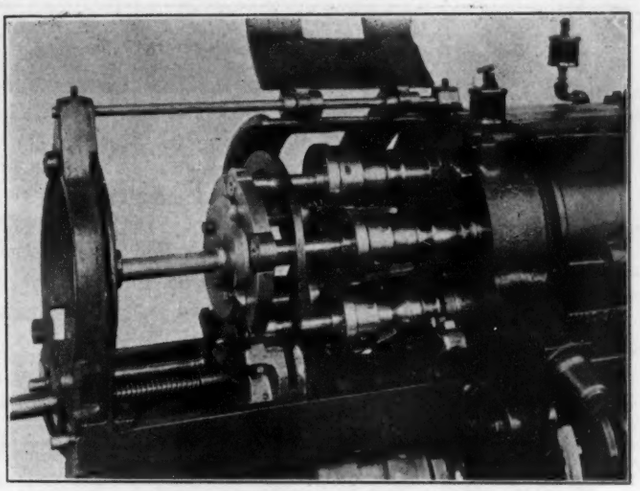


FIG. 2—STOCK FEED END OF NEW AUTOMATIC SHOWING IMPROVED FEED TUBE CONTROL

Rigidity Is Sought

(*Continued from Page* 423)

the new tools and equipment announced during January. Practically all are featured by improvements that distinguish them from previous models. A number of the machines are similar to others heretofore marketed by their builders, but are of a new size or capacity to meet recently developed requirements. A few machines represent marked progress in design when compared with their predcessors.

Rigidity seems to be a quality sought by the designers of many of the January tools. Attempts to minimize vibration are witnessed in the strong frame, five-bearing camshaft and short-throw cam levers of the new five-spindle automatic developed by the National Acme Co.; in the heavy design of the cross-rail, spindle, bearings and driving gears of the new rod miller brought out by the Niles-Bement-Pond Co.; in the arrangement of the two tool heads and in the design of the automatic chuck of the Betts Machine Works car wheel boring machine; in the heavy frame of the Ryerson company's new friction saw; and in other tools.

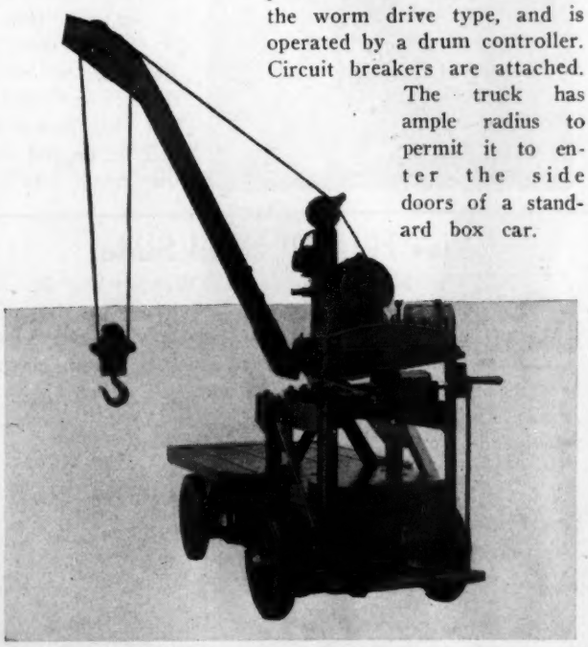
The new 9/16-inch, five-spindle, automatic screw machine, identified as No. 4 on page 424 and illustrated in Figs. 1 and 2 above, embodies a number of

(*Continued on Page* 427)

Develops Industrial Crane Truck

No. 5

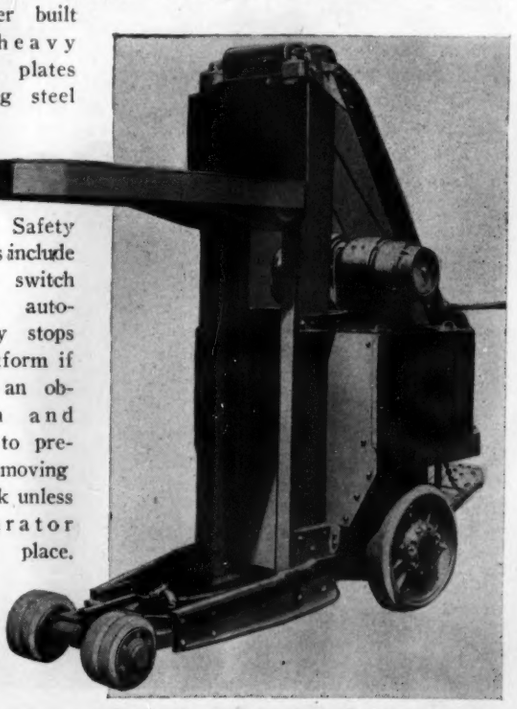
The Crescent Truck Co., Lebanon, Pa., has designed a new industrial crane truck having a lifting capacity of 1500 pounds. In this truck the loading platform is 66 x 44 inches, the height of the platform from the floor 24½ inches, overall length 9 feet 3 inches, the turning radius 8 feet 2 inches, and wheel base 4 feet 10 inches. The power unit of the crane is of the worm drive type, and is operated by a drum controller. Circuit breakers are attached. The truck has ample radius to permit it to enter the side doors of a standard box car.



Truck Lifts Load Six Feet

No. 6

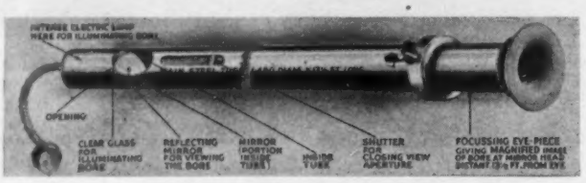
The Elwell-Parker Electric Co., Cleveland, recently has placed on the market a new type lift truck capable of lifting a load any height up to six feet. The truck is 112 inches long, 95 inches high and can be driven through a 3½-foot doorway. The load deck is a centilever built of heavy formed plates on long steel arms. Safety features include a trip switch which automatically stops the platform if it hits an obstruction and devices to prevent moving the truck unless the operator is in place.



Wrench Has Special Features

No. 7

The Ever-Grip Wrench Co., Chicago, has introduced a pipe wrench having only three parts. It is made from drop forged, heat-treated steel and is designed to withstand rough usage. It is claimed its special design permits a jaw capacity and leverage, when opened, considerably in excess of the rated size when closed. The jaws are opened by turning the handle to the left.



Aids Examination of Forgings

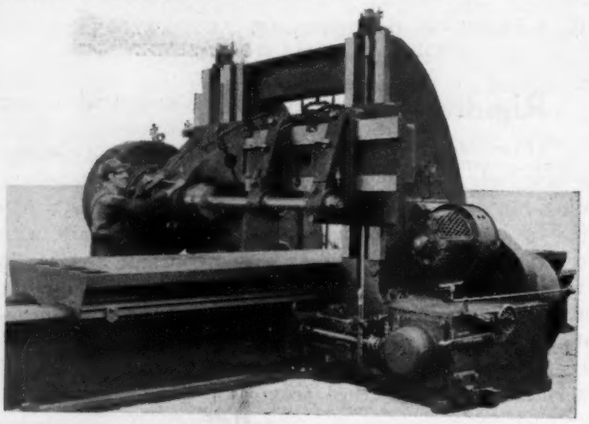
No. 8

Aldis Bros. Sparkhill, Birmingham, England, have developed a periscope for examining the structure of forgings, particularly for turbine or generator rotors. After a hole has been drilled through the center of the forging, the structure of the steel may be examined by the instrument, shown in the accompanying illustration. The device gives an enlarged view of the metal.

Builds Rod Milling Machine

No. 10

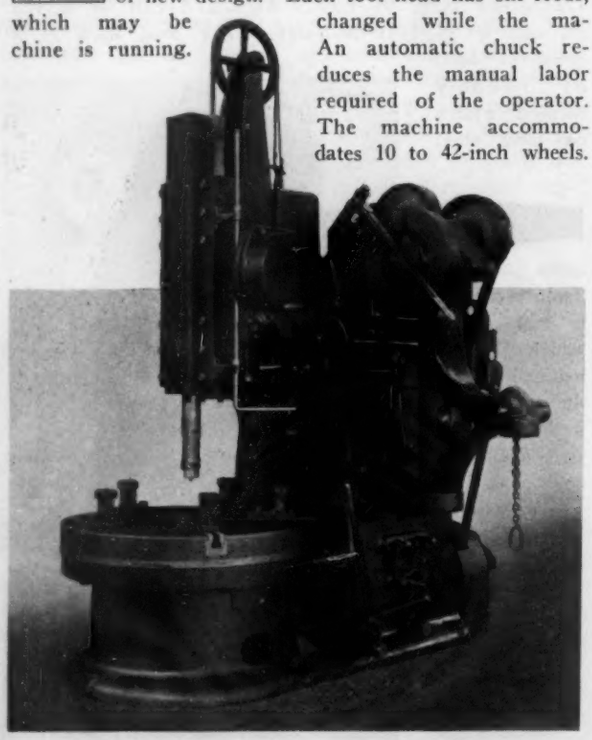
The Niles-Bement-Pond Co., Philadelphia, has designed a heavy rod milling machine for locomotive work. The crossrail has rapid power feed in both directions and a vertical feed for raising the cutter out of the work. The downward feed is manually operated as a safeguard against breakage. The feed motor is wired so that it shuts off when the driving motor is shut off. Another feature of the feed motor is a special control which eases off the pulling power when the cutter meets with unusual resistance in the work due to hard spots or excess metal. The machine is equipped with a complete cutting fluid circulating and draining system. The distance between housings is 58 inches, width of table 54 inches, length of table between end pans 16 feet, and working height under arbor 32 inches.



Wheel Borer Has Automatic Chuck

No. 9

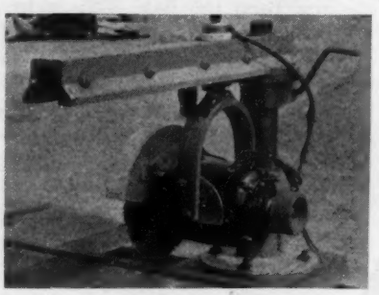
The Betts Machine Works of the Consolidated Machine Tool Corp., Rochester, N. Y., has developed a car wheel boring machine of new design. Each tool head has six feeds, which may be changed while the machine is running. An automatic chuck reduces the manual labor required of the operator. The machine accommodates 10 to 42-inch wheels.



Motor Device Has Many Uses

No. 11

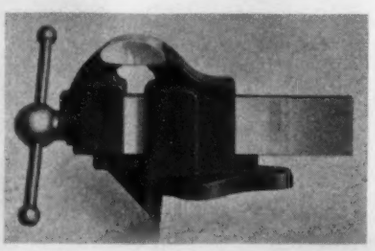
The DeWalt Mfg. Co., Leola, Lancaster, Pa., recently has introduced an electrically driven bench machine designed for use by manufacturers, woodworkers, pattern makers, etc. The device is an electric motor mounted on a swivel attached to a vertical post. A saw, cutter, grinding wheel buffer, or pulley can be mounted directly on end of the motor shaft.



Vise Has All Steel Slide

No. 12

The Simplex Tool Co., Woonsocket, R. I. has placed on the market a vise having an all steel slide. The body of the vise is cast of special crucible metal and the jaws are made of fine grade steel hardened and ground. The screw is of steel with machine cut square threads and is retained by a cap in front of the sliding jaw.



Rigidity Is Sought

(*Continued from Page* 425)

striking improvements. The most notable departure, from the standpoint of adaptability, is the use of five work spindles instead of four as offered on previous models of National Acme Co., machines. Realizing that the degree of accuracy in the product depends upon the precision of alignment maintained between the tools and the work, the builders have designed a sturdy frame with five upright main supports resting on nine pedestals cast in the pan. This frame construction affords five bearing supports for the main camshaft, insuring the rigidity necessary when the machine is operating at high speed.

The drums on the camshaft are well up under the bed so that camming and indexing is accomplished by the direct application of rolls from the drum. Freedom from chip clogging is assured by the location of the drums in reference to the tooling area. Since no operating mechanism is below the plane of tooling, chips cannot become lodged in the under-works.

The new machine also differs from earlier models in that it is designed for the use of right-hand tools exclusively. The five-faced main tool slide is supported at three points, as shown in Fig. 1, assuring the rigidity necessary for the proper alignment of the tools with the work spindles. The spindle carrier is of new design. The cylinder member is supported in bearings at either end with a bearing surface equal to half the length of the cylinder. The spindle drive indexing mechanisms have been placed between the spindle bearings instead of at the end of the spindle carrier as in earlier models.

Indexing Without Shock

When operating at a productive capacity of 3000 pieces per hour, the machine requires security in locking the spindle carrier and construction capable of avoiding strain and shock at the stopping points. This is better appreciated when it is understood that the spindle carrier is indexed about once each second. A new arrangement of the lock and latch bolt system provides for the positive locking of the spindle carrier while the action of rollers of the index gear with the cam on the main camshaft accomplishes the indexing without shock.

Contrary to the practice on earlier machines the new model has drawback collets, which combined with the use of flat tool holders directly supported on the main tool side, permits the tools to be held close to the cutting points. The stock stop does not occupy a tool position; therefore tools may be used for all five spindles. The stock feed slide is shown in Fig. 2.

The automatic chuck on the car wheel borer developed by the Betts Machine works of the Consolidated Machine Tool Corp. is controlled by a reversing friction clutch so that it is unnecessary to stop or reverse the motor when closing or opening the chuck. When the driving clutch is thrown in, the table starts to rotate and the jaws move toward the center, gripping the wheel with the full driving force of the motor. Therefore the heavier the cut the tighter the grip of the jaws. When the bore is finished the table is stopped by a band brake operated by a foot treadle and the clutch then is thrown into the reverse position, causing the jaws to open instantly without stopping the motor. The band brake also permits the operator to stop the table to caliper the bore without danger of loosening the grip of the jaws on the wheel.

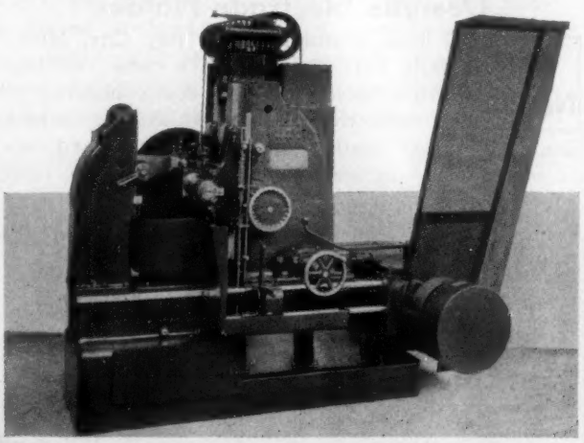
The new rod milling machine developed by the Niles-Bement-Pond Co. is a good illustration of a piece of equipment in which provision has been made for future improvements in cutting tools. The machine, while normally requiring

(*Concluded on Page* 429)

Cuts Gears on Production Basis

No. 13

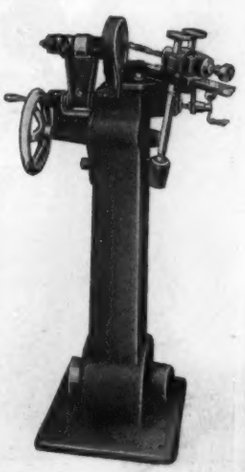
Gould & Eberhardt, Newark, N. J., has brought out a new manufacturing hobbing machine for roughing or finishing spur or helical gears in quantity. The hobber is designed to produce accurate gears at fast feeds and speeds, and for this reason it is rigidly constructed. Parts subject to unusual wear may be adjusted easily. The flow of power from the prime mover to the cutter spindle and to the work spindle is substantially equalized, the object being to utilize and balance the normal backlash of the parts. The transmission of power throughout practically the entire machine is by heat treated, alloy steel gears. The hobber is rated for a maximum of 3 diametral pitch in steel with a diameter capacity of 18 inches and 14-inch face.



Grinder Points Small Drills

No. 14

The Oliver Instrument Co., Adrian, Mich., recently placed on the market a semi-automatic drill grinding machine designed for drills ranging in size from No. 60 to ½ inch. The grinding is performed by passing the grinding wheel across the point of the drill while the latter is turning. At the same time the wheel is fed to the drill by means of a cam and spring. This motion uniformly increases the angle of the point clearance as the web of the drill is approached. These motions are controlled automatically so that the operator has only to set the drill in the correct relation with a setting gage. One setting takes care of the grinding of both drill lips and insures both being generated at the same length and at the same angle. The wheel is driven by a motor in the base of the machine and the generating mechanism is operated by a hand-wheel on a crankshaft. The grinder is supplied with a large and small bushing holder, a V-rest for supporting the end of the drill, a drill chuck, a No. 1 to No. 2 Morse taper sleeve and a wheel truing device. The machine is designed to grind two-fluted drills only.



Designs Guard for Mill Lamp

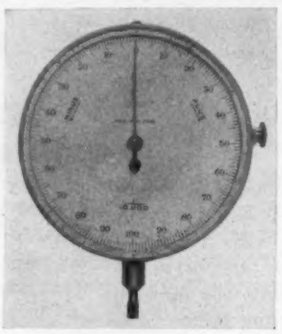
No. 15

The Flexible Steel Lacing Co., 4607-31 Lexington street, Chicago, recently has introduced a new guard for mill type lamps, especially those of 25 and 50-watt sizes. The guard is made of expanded steel, is reinforced, and tinned, making it strong and serviceable. The guard is made in two types, namely locking and non-locking. A key is furnished to lock the first type while in the second case the guard is closed with slotted round head screws.

Introduces New Dial Gage

No. 16

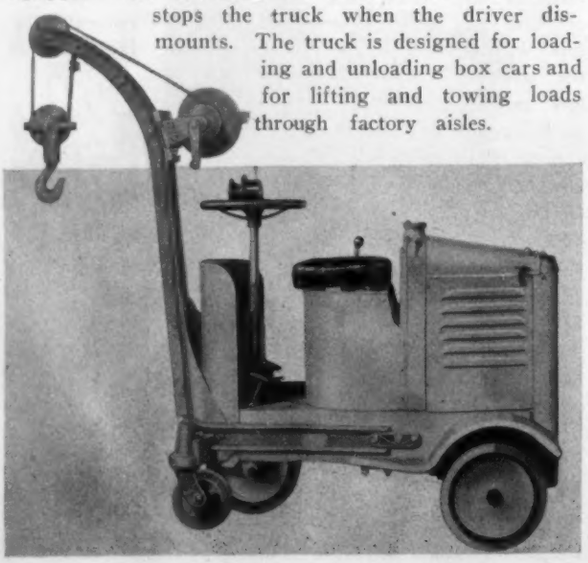
The Federal Products Co., 393 Harris avenue, Providence, R. I., has introduced a new dial gage. The outside diameter of the case is 3 11/16 inches while the graduations, which are in 0.0001-inch increments, are nearly 1/18 inch apart. The device is furnished in three models. The dial can be set at any desired position in relation to the hand by turning the knurled bezel.

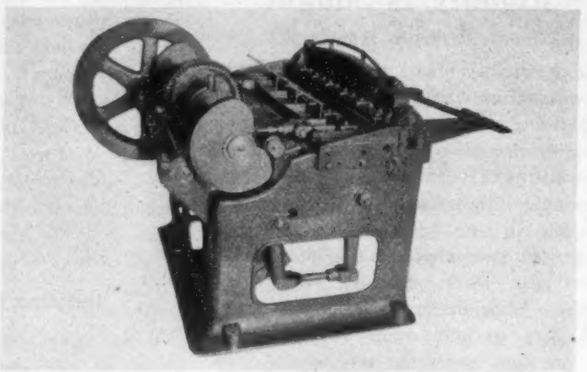


Industrial Tractor Carries Crane

No. 17

The Clark Tructractor Co., Buchanan, Mich. has introduced a small gasoline industrial haulage vehicle with crane attachment. The tractor pivots on one wheel and has a turning radius of about 52 inches, being able to turn around in a box car. The tractor is designed to tow from seven to ten tons. The crane attachment will lift and carry loads up to 2000 pounds, a braking device permitting the load to be carried at any height to 56 inches. Traction is provided by 16-inch wheels equipped with 3½-inch solid rubber tires. A brake stops the truck when the driver dismounts. The truck is designed for loading and unloading box cars and for lifting and towing loads through factory aisles.





Builds Hinge Brake for Hoods

No. 18

The Yoder Co., Cleveland, recently introduced a bulldozer-type hinge brake for forming hinges on automobile hoods. The machine is built with a one-piece, self-contained base or frame. All bearings are cast integral with the frame, making a rigid form of construction. A heavy fly-wheel provides power for the intermittent load. Efficient and positive stop and control are claimed, and provision is made for the necessary adjustment of working parts. The machine will form automobile hood hinges up to 50 inches in length and of various sizes to ½ inch in diameter and of No. 18 gage and lighter steel. Any length of notch can be accommodated and the bottom edge of the hood side panels also can be rolled. Two sheets are worked simultaneously forming a complete hinge in one operation.

Hearth Made of Pressed Steel

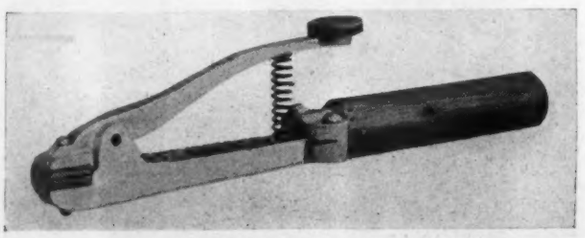
No. 19

The Buffalo Forge Co., Buffalo, has introduced a forge with a hearth made from pressed steel. The hearth is 30 inches square and the water box, also of pressed steel construction, is 24 x 10 inches. The steel construction it is claimed, minimizes corrosion.

Designs Electrode Holder

No. 20

The Gibb Instrument Co., Bay City, Mich., recently has introduced a new welding electrode holder. In this device material of high conductivity is used which it is claimed eliminates excess heating of the electrode, and unnecessary delay in waiting for the holder to cool.



Rigidity Is Sought

(*Concluded from Page* 427)

a 75-horsepower motor, is designed with a sufficiently higher factor of safety than usual to transmit power from a 100-horsepower motor in case milling cutters capable of cuts and feeds requiring this power become available.

Another example of the attempt being made to absorb the severe stresses incident to fast feeds and speeds is found in the gear hobbing machine developed by Gould & Eberhardt. The gear trains are arranged so that the flow of power from the prime mover to the work spindle and to the hob spindle is equalized, the object being to utilize and balance the normal backlash of the parts.

The bulldozer-type hinge brake developed by the Yoder Co. illustrates the trend in the design of special equipment for forming sheet metal details for automobiles. While the machine is intended primarily to serve the purpose of forming hinges on automobile hoods, it may be adjusted to handle a wide range of sizes and gages of hood panels and many different sizes of hinge and also may be used to roll the bottom edge of side panels.

Manufacturers of gasoline and storage battery industrial trucks continue to bring out new models. The tendency toward the use of small crane booms, elevating platforms, etc. in connection with standard truck bases is marked.

Continue Bethlehem Merger Probe

New York, Feb. 5.—George Heilman, general purchasing agent of the Otis Elevator Co., testified in the hearings of the federal trade commission's suit for the dissolution of the Bethlehem-Midvale-Lackawanna merger that he bought shapes Monday, Jan. 28, from the Eastern Steel Co. at 2.35c, base Pittsburgh. On the same day, he said, the Bethlehem Steel Co. quoted him 2.40c. The following day, he said, the Eastern Steel Co. increased its price to 2.40c.

Mr. Heilman's testimony was representative of that of most witnesses at this stage of the inquiry. He said his company buys 10,000 to 12,000 tons of steel a year. He never bought from Lackawanna and said that on only one occasion, in 1921, had a Lackawanna salesman called on him. He said he bought 1500 tons of shapes from the Cambria Steel Co. in 1920 but nothing after that. He has placed a small part of his tonnage with Bethlehem since 1921. He mentioned a number of companies as his sources of steel supply. He buys about 8000 tons of pig iron a year, some from Bethlehem and some from Cambria before the merger. He said he prefers to buy iron from merchant rather than steel works furnaces.

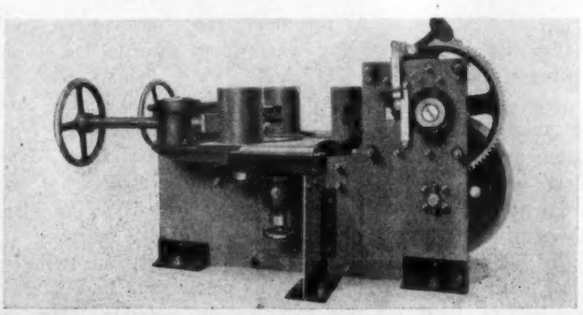
The testimony touched on the consuming requirements of the various companies and their several sources of supply, dictated by many factors of delivery and habit. George Bell, general manager of the Eastern Bolt & Nut Co., Providence, R. I., spoke from the viewpoint of purchases of 1200 to 1500 tons of bars per year, nearly all of which are sold by the Carnegie Steel Co. Chester Wales of the Federal Sign Co., Albany, N. Y., buyer of 800 to 1200 tons of steel each year, told of buying from a number of important producers. He said that Bethlehem always had shown a disposition to sustain prices rather than bear the market, and admitted that stable prices are preferable to fluctuating markets. He said that demand fell off about the middle of last year, but that prices for steel have remained firm, which was contrary to his expectation.

Sprague Iron Works, Chicago, has increased its capital stock from $25,000 to $100,000 to provide for additional working capital.

Introduces Bending Machine

No. 21

Henry Pels & Co., Inc., 90 West street, New York, have brought out a new horizontal eccentric bending and straightening machine designed primarily for use in railroad shops and iron and steel fabricating plants. Small as well as large sections can be bent or straightened. The bending blocks are moved forward and backward on an arc so that as the blocks approach the ram head they shorten their distance to accommodate smaller sections and shorter radius curves. The table is wide to insure ease in handling materials and in addition has a horizontal roll placed on each side to facilitate pushing the bars across the table. The bending blocks are adjustable independently from each other by means of hand wheel and screw which moves a relatively small space. For bending rails or similar heavy sections it is advisable to use blocks between the ram head and the section to be bent.



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NOTE: *This index will be carried forward in subsequent issues and suitable cross references will be given in alphabetical lists of kinds of equipment and names of manufacturers.*

Heat Treating Problems Studied

American Society for Steel Treating Holds Winter Sectional Meeting at Rochester—Plant Inspections a Feature—Many Technical Papers Are Presented—Recommended Practice Committee Submits Standard Heat Treating Definitions

MORE than 150 members of the American Society for Steel Treating attended the winter meeting of the society held at the Hotel Seneca, Rochester, N. Y., on Thursday and Friday of last week, Jan. 31-Feb. 1. This was the fifth sectional meeting to be held in the last two years, but it was undoubtedly the most successful both from the standpoint of attendance and the standard of technical papers. At the session of Thursday afternoon, an unusually interesting program was prepared and was well attended, more than 250 members and guests hearing the papers. Two technical sessions were held on Thursday, a luncheon at noon and a dinner in the evening, while the entire day Friday was given over to visitation of local manufacturing plants.

A meeting of the board of directors of the national society was held on Friday morning. At this time a set of heat treating definitions, as drawn up by the recommended practice committee, was approved and a resolution passed that the definitions be placed in the hands of Dr. G. K. Burgess, national president, who will submit them to other technical societies for suggestions. Should the definitions meet with the approval of other organizations, they will be placed before the society's membership for a vote.

Manufacure of Small Tools

The opening session of the meeting held on Thursday morning in the ballroom of the Hotel Seneca was called to order by J. J. Desmond, chairman of the local committee on arrangements, who after a few words of welcome, introduced E. F. Cone, *Iron Age*, New York, as chairman for the session. The first technical paper, "Some Carbon and High Speed Steels Used in the Manufacture of Small Tools," was presented by A. H. d'Arcambal, chief metallurgist, Pratt & Whitney Co., Hartford, Conn. Briefly the speaker touched upon the various methods employed in the manufacture of tool steel, pointing out that two of the common defects are that hammering or working of the metal is done at too high a temperature or that insufficient working is done, with the result that a network of cementite is produced. Annealing and normalizing frequently is necessary to put the steel in a workable state. He then reviewed the various types of alloy tool steels and specified their approximate hardening ranges.

Mr. d'Arcambal stated that tool steel should not be heated in a salt bath containing cyanide because some of the nitrogen is bound to be absorbed. At present the most popular type of tool hardening furnace is either oil or gas-fired but development of the electric furnace for this work gives considerable promise. When a barium salt bath melted in a crucible is used for heating high speed steel, a carburizing action is obtained. Its use is not advised. The open-fire method seems most desirable for heating and with the furnace atmosphere properly controlled, oxidation is negligible. Mr. d'Arcambal defined high speed steel as properly hardened if file hard on the ground surface after the 1100 degree Fahr. draw. In closing, he warned that high speed steel never should be rehardened without first annealing it. Numerous specimens of tools were exhibited to show good and defective work.

Advances New Theory

"Structure of Metals," by O. W. Ellis, assistant professor of metallurgy, University of Toronto, Toronto, was the title of the second and final paper on the morning program. Prof. Ellis advanced the theory that during the last stages of solidification, a point is reached at which the forces of crystallization of neighboring crystallites neutralize each other and the tendency for atoms to arrange themselves upon the space lattices of the crystallites is eliminated. The atoms in the residual liquid metal, being no longer under the control of the crystallic forces of contiguous crystals, called together under the influence of surface tension into spheres of varying diameter. Within these spheres the atoms are oriented in a way similar to that wherein the atoms are arranged in colloidal particles or, in the crystal nuclei or embryonic crystals, which form in the first stages of the freezing metals. On the speakers theory, there exist between metallic crystals not continuous films or layers of amorphous material such as are postulated in the amorphous cement theory, but large numbers of discrete spherical particles, which link the crystals at numerous small surfaces of contact.

In discussing Prof. Ellis' paper, Dr. S. L. Hoyt, General Electric Co., Schenectady, stated he did not believe Prof. Ellis has proved his hypothesis and he was inclined to prefer the hypotheses advanced by previous investigators. Dr. Zay Jeffries, director of research, Aluminum Co. of America, Cleveland, agreed with the views of Dr. Hoyt and offered applications of the slip-interference theory which tended to prove the Rosenhain theory rather than the one proposed by Prof. Ellis. By way of example, he stated that assuming a wire made up of molecules placed end to end and having a diameter equal to the diameter of a molecule, failure of the wire would occur on a slip line at 45 degrees to the axis of the wire rather than between two molecules.

Controlling Production Scientifically

Following a luncheon at noon, the afternoon program was opened by a short address of welcome to Rochester by Mayor Clarence D. Van Zandt. A W. F. Green, metallurgist, John Illingworth Steel Co., Philadelphia, presided as chairman, introducing as the first speaker, H. M. Boylston, head of the department of metallurgy, Case School of Applied Science, Cleveland, who presented a paper, "Control of Production by Scientific Methods." In his opening remarks, Prof. Boylston traced the production of iron back to biblical times, naming Tubal Cain as the first worker of iron and other metals. After discussing the history of steelmaking in the United States, the speaker outlined the modern methods of controlling production. These were given as: 1. Control of temperature; 2. control of chemical content; 3. control of quality by physical tests; 4. control of structure by metallographic examination; and 5. control by inspection of raw material. Discussing these fine methods of control in detail, Prof. Boylston used numerous lantern slides to illustrate the various types of pyrometers, physical testing machines and metallographic equipment which is available.

At this point, the chairmanship of the meeting was turned over to Dr. Walter M. Mitchell, Philadelphia, who introduced as the next speaker, Dr. Ancel St. John, research laboratory, Union Carbon & Carbide Co., Long Island City, N. Y., who presented a most interesting paper entitled "X-Rays and Steels." Beginning his remarks, Dr. St. John explained briefly the molecular composition of matter and how it makes X-ray examination possible. He then

explained how its use is applied to the study of steels. By way of demonstration, a portable X-ray machine was set up and operated and the comparative X-ray sensitivity of lead, aluminum and steel shown. According to the speaker, probably the most etxensive use of this method of testing has been at the Watertown arsenal where a number of heavy cast steel ordnance castings have been examined. Some startling discoveries were made, a few of them being illustrated by means of lantern slides.

Defects Are Eliminated

In ordnance work it is essential to obtain maximum strength with minimum weight. X-ray examination, however, showed that blowholes and gas pockets were so numerous that the castings were rendered unfit for service. By experimentation with gating the molds, perfect castings were obtained. The arsenal now is considering the construction of a 750,000-volt apparatus to facilitate the examination of heavier sections, the present equipment being too small for high power work. As described in the Nov. 8, 1923 issue of IRON TRADE REVIEW, page 1299, Dr. St. John has devised a new method for studying the soundness of small steel parts by X-ray. The parts are packed in an absorbing medium in suitable containers, a method which defines detail with remarkable sharpness and makes the locating of flaws much simpler. A number of X-ray photographs were shown and interpreted. In concluding, Dr. St. John pointed out the advantages of X-ray examination and predicted that in the future it will find extensive use in the study of material before work has been done upon it, thereby eliminating useless work.

The next paper was given by J. V. Emmons, chief metallurgist, Cleveland Twist Drill Co., Cleveland. The subject of Mr. Emmons' paper was "Annealing of Tool Steel," and the remarks were confined to carbon tool steels or those in which only small amounts of the usual alloying elements are present. In annealing, the temperature always should exceed the critical point by a safe margin, sometimes as much as 200 degrees Fahr. If the grain size of the steel is too large to anneal at 200 degrees above the critical point, it is best to normalize the stock. Stock that has been seriously overheated must be placed in its original condition by mechanical work, but if the overheating was not severe, a second annealing may be sufficient. The rate at which the steel is cooled after heating is important. Decarburization and precipitation of graphite are two actions which spoil material. Too frequent annealing may increase the precipitation of graphite. According to Mr. Emmons, the addition of a small amount of chromium, say 0.15 to 0.20 per cent considerably lessens the chances for graphite formation.

Study Theoretical Stresses

"The Photoelastic Method of Stress Analysis" was the title of an illustrated paper presented by A. J. Kimball, research laboratories, General Electric Co., Schenectady, N. Y. The basis for this type of testing is the principle of polarized light and the use of celluloid models of the same dimensions of the steel parts which are under stress. The celluloid models are placed under stresses proportionate to the actual parts with the result that stress bands are formed, appearing as alternate yellow, red and blue when viewed through the eyepiece. The number of times which this series of three colors appears indicates the order of stress. Celluloid models of electric railway motor pinions were placed under stress and photographs of the stresses were obtained. Curves were obtained showing where maximum stresses occurred and where failure might be expected.

In conjunction with this paper, G. R. Brophy, also of the research laboratory, General Electric Co., presented an illustrated paper entitled "Some Properties of Railway Motor Pinions." This paper, which was illustrated, reviewed actual tests made on standard pinions and bore out the experimental tests on the celluloid models. When a pinion was fractured by driving a taper shaft through it, the break occurred through the teeth in 75 per cent of the cases. Teeth broke out in the shape of a *V*, the *V* being more pronounced when the breaking stress was increased. Hub rings of the same size as the pinions, but having no teeth, proved to be stronger than the pinions.

Industry Saves Money

On Thursday evening an informal dinner was held at the Rochester chamber of commerce. Due to illness, Dr. Rhush Rhees, president of the University of Rochester, was unable to serve as toastmaster, and his office was filled by S. M. Havens, a director of the society and assistant treasurer and manager, Ingalls-Shepard division, Wyman-Gordon Co., Harvey, Ill. James Gleason, president, Gleason works, Rochester, extended a greeting on behalf of the chamber of commerce, while Dean Arthur S. Gale, University of Rochester, extended a greeting on behalf of the university. Dr. George K. Burgess, national president of the society, and director, United States bureau of standards, Washington, was unable to be present to deliver his address. However, he had sent as his representative, R. M. Hudson, assistant chief of the division of simplified practice, Washington. Mr. Hudson read an interesting paper on the simplification and standardization work being done by the government. By the elimination of unnecessary sizes and styles, industry has been saved millions of dollars a year. This saving is divided between the manufacturer and the consumer. The work of the division is expanding continually as new lines are suggested. It is significant that the national government has undertaken this work on behalf of industry.

No technical sessions were held on Friday, the entire day being devoted to inspection trips. At the Gleason works, the first plant visited, the party was conducted through the machine shop, foundry and heat treating shop. A new continuous electric tool hardening furnace installed recently proved of great interest. At the plant of the Taylor Instrument Co.'s, the visitors saw the manufacture of thermometers, barometers, pyrometers and gages. At noon a complimentary luncheon was served by the Bausch & Lomb Optical Co., after which the party was taken through the optical glass making plant, lens grinding departments, laboratory and show room. The final trip of the afternoon was a visit to the research laboratories of the Eastman Kodak Co.

Bethlehem Aids Workers in Buying Stock

Eugene G. Grace, president of the Bethlehem Steel Corp. has announced an employe saving and stock ownership plan under which the corporation will assist its employes to purchase its 7 per cent cumulative preferred stock on easy payments. Mr. Grace said that the recent extension of the properties and rearrangement of the financial structure of the corporation put it in a position where it can make an offering of this kind. He summarized the outstanding features of this year's plan at the annual meeting of employe representatives at the Lackawanna plant, Jan. 31. An employe may subscribe for shares of stock at the rate of one share for each $400 of annual earnings. The price in the first year's offering will be $94 per share.

The plan makes provision for credits of dividends and interest charges that will result in a net cost to the employe substantially below the purchase price.

As an added incentive to employes to hold the stock and to continue in the employ of the corporation, it has agreed to make special bonus payments every year for five years from the time the stock is purchased, amounting to $1 per share for the first year; $2 per share for the second year, and on up to $5 per share at the end of the fifth year.

Canadian Engineers Hold Annual Meeting

The Engineering Institute of Canada held its annual convention on Jan. 22-24, the first session being held at Montreal and devoted mainly to routine business. In the evening F. J. D. Barnjum, a prominent lumberman delivered an address urging drastic and immediate action to prevent the exhaustion of Canadian forest resources. The other sessions were held at Ottawa, the principal feature on Jan. 23 being a comprehensive address by Dr. Charles Camsell, deputy minister of mines, on the question of the fuel supply, in which he outlined the steps that have been taken to arrive at a solution of the problem. Preparations, he said, would be made several years ahead for the time when Pennsylvania anthracite no longer will be available. The most promising of the proposed substitutes, he stated were Alberta coal, by-product coke, Welsh anthracite, and peat.

At the last session a long discussion followed a paper on the proposed St. Lawrence power development by D. W. McLachlan of the department of railways and canals. Mr. McLachlan favored the Dowden-Wootun scheme of single stage development on the ground that ice formations between Morrisburg and the Long Sault rapids would render impracticable the double stage development as proposed by the Ontario Hydro-electric commission. F. A. Gaby and H. G. Acres, of the Ontario Hydroelectric commission strongly favored the double stage project, contending that the ice difficulty was not insuperable. Their opinion was supported by Howard T. Barnes and George A. Mounfain of the dominion board of railway commissioners. In the afternoon many of the delegates visited the refinery of the British American Nickel Corp. at Deschenes. In the evening a ball was held at the Chateau Lauvier.

The election of officers resulted as follows: President, Walter J. Francis, Montreal; vice presidents J. B. Challies, Ottawa, F. F. Shecorwood and A. Surseyer, Montreal, and F. A. Bowman, Halifax; treasurer Major General Sir Alex Bertram, Montreal; secretary Fraser S. Keith, Montreal.

Sets Silvery Record

The Jisco furnace of the Jackson Iron & Steel Co., Jackson, O., produced 197 tons of silvery pig iron on Jan. 26 and 199 tons on Jan. 27. These tonnages are reported by the company as the largest of silvery iron ever made in one day. The furnace was blown in Thanksgiving day, 1923 after being down three months for relining, improvements and repairs. A new water system, a mud gun and a pig iron breaker were included in the improvements. The furnace has a 13-foot hearth with 8 tuyeres. It is 75 feet high with an 8-foot bell and 12-foot stock line. H. R. Shick, formerly blast furnace superintendent of the plants at Johnstown and Monessen, Pa., of Cambria Steel Co. and Pittsburgh Steel Co. is general superintendent of the Jackson company.

To Make Ferro

The Ferro Manganese Co., San Francisco, has been incorporated to handle manganese ores and their products. The company owns extensive mining properties in Stanislaus county and is operating these properties and developing them for increased production. A plant is being equipped in Berkeley, Cal., for conversion of manganese ores into marketable products. The company plans extension of this plant to produce ferromanganese in sufficient quantities to supply the Pacific coast demand. The officers of the company are: Arthur P. Holland, president; Robert C. Oliphant, vice president and Herbert W. Erskine, secretary. Offices of the company are located at 341 Montgomery street, San Francisco.

Gulf Steel Net Up

Net profit of the Gulf States Steel Corp., Birmingham, Ala., in 1923 increased 64 per cent over that for the preceding year. For the full year the net amounted to $1,576,521 compared with $958,207 in 1923. Operating results of the final quarter were less satisfactory by comparison with the corresponding period of 1922. In the three months ended with Dec. 31 operating income was $388,365 against $585,078 one year before. Net profits amounted to $265,866 against $399,942 in the last quarter of 1922.

Convention Calendar

Feb. 4-8—American Institute of Electrical Engineers. Midwinter convention at the Bellevue-Stratford hotel, Philadelphia. F. L. Hutchison, 29 West Thirty-ninth street, New York, is secretary.

Feb. 4-9—American Ceramic society. Annual meeting, Atlantic City, N. J. R. C. Purdy, Ohio State University, Columbus, O., is secretary.

Feb. 18-21—American Institute of Mining and Metallurgical Engineers. Meeting in New York. F. F. Sharpless, 29 West Thirty-ninth street, New York, is secretary.

April 24-26—American Electrochemical Society. Spring meeting at Philadelphia, Dr. Collin G. Fink, Columbia university, New York, is secretary.

Ironton Nail Makers Complete Merger

Merger of the Belfont Iron Works and the Kelly Nail & Iron Co., both of Ironton O., has been completed by approval of stockholders of the former, the shareholders of the latter having previously voted favorably. Incorporations papers will be filed at once. The name of the new company will be the Belfont Steel & Wire Co. Directors of the Belfont Iron Works and two directors of the Kelly Nail & Iron Works will meet soon to elect officers and directors for the new company. It is forecast that S. C. Peebles, president of the Belfont Iron Works, will be president and I. P. Blanton, vice president of the Kelly Nail & Iron Works will be vice president.

Plans include construction of a steel plant at Ironton and addition of a pig casting machine at the Sarah furnace of the Kelly Nail & Iron Co. Each company in the merger has one blast furnace stack at Ironton, with 150,000 tons per year combined capacity. The Belfont plant includes a wire mill with production of 21,000 tons of plain wire and 270,000 kegs of nails per year, wire fencing and galvanized products. The Kelly plant has capacity for 700,000 kegs of wire nails annually, 30,000 tons of wire, 8000 tons of barbed wire and 250,000 kegs of cut nails. In the past wire rods for wire have been obtained from other producers and the projected steel works is intended to supply this material direct.

The Belfont capitalization is $1,250,000 of common stock and $750,000 of 8 per cent preferred, all the common having been issued and $285,000 of the preferred. The Kelly Nail & Iron company has $300,000 of common stock.

Holds Outlook Favorable

Favorable business prospects for 1924 with keener competitive conditions were forecast by President W. H. Foster of the General Fireproofing Co., Youngstown, O., at the annual meeting of stockholders. The financial report of the company shows net profits of $532,047 from 1923 operations and after payment of preferred dividends, a net balance of $434,705 for surplus. The balance sheet of the company shows cash and accounts receivable of $1,658,289 and inventories of $1,841,284 among total assets of $5,511,542. Notes and accounts payable amount to $1,313,595 of the liabilities.

Ore Record for 1923 Completed

Official Tabulation Made by Iron Trade Review Shows 60,780,003 Tons Forwarded from Lake Superior District, Gain of 16,789,907 Over 1922—Output Per Active Mine Larger Than in 1916—An Interpretation of the Figures

BY A. J. HAIN

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ALL shipments of iron ore from the Lake Superior district in 1923 total 60,780,003 tons, according to the compilation just completed by IRON TRADE REVIEW. This amount added to all prior shipments from the time of the opening of the ranges shows the complete record as 1,134,525,937 tons—a billion tons of which has been shipped in the last 25 years.

Shipments in 1923 exceeded those of 1922—43,990,096—by 16,789,907 tons. They were the largest since 1918, in which year the total was 62,836,172 tons. In only two other years, during the war period, were the tonnages greater than that of 1923. In 1917 the total was 64,437,003, and in 1916 it was 66,658,466.

A comparison shows that the average yearly shipment in the last five years has been 47,349,333 tons, against 54,786,823 tons average for the preceding five years, which included the war years. In the last five the output has been only 86.4 per cent as large as during the prior period. When the same comparison is made as to pig iron, the production in the last five years is found to be approximately 89 per cent of the earlier five-year span.

If the last 60 years are divided into five-year periods, it will be noted that there is a steady succession of upward steps in shipments of Lake Superior iron ore in those periods, until the last five years when the first downward step is registered. Thus, in the last five years the total is 236,746,668 tons, compared with 273,934,118 in the time from 1914 to 1918, inclusive. This first "dip" of the five-year trend line is due to the extraordinary record during the war, and the slackening that has been pronounced up until equilibrium was restored in 1923.

Measured in 10-year periods, the picture is changed, and there is a steady upward movement, as illustrated in the accompanying chart. There is a suggestion in this as to the wisdom of planning ahead in a basic industry, with the assurance that despite temporary peaks and depressions the increment in averages is certain.

The Lake Superior district supplied approximately 85 per cent of all the iron ore used in the manufacture of pig iron in the United States in 1923. This was the largest proportion in recent years; in 1919 the percentage was 86.69, and in 1920, 84.80, the figures for the intervening years being 79.43 for 1921 and 80.32 for 1922.

Another comparison shows that the tonnage of pig iron produced from year to year in the United States is holding fairly uniform to a certain ratio, with Lake Superior iron ore shipments. In the last 25 years, the ore shipments have totaled 1,002,837,027 tons. The pig iron output in this period has been 645,283,000 tons. The iron output is 65.3 per cent of the ore tonnage. Twenty-five years ago, in 1899 the pig iron output was 74.5 per cent of the year's ore total. In 1921 the percentage was the highest, 76, while in 1916 it was the lowest 59. In 1923 the percentage was 65.5, practically the figure representing the average for the last 25 years.

The ability of the Lake Superior iron mining organization to meet requirements is well illustrated by the record of 1923. In 1922 43,990,096 tons of ore was shipped from 201 mines, while in 1923 60,780,003 tons was forwarded from 210 mines, an increase of 38 per cent in output, with an addition of only nine mines to the operating list.

The largest yearly shipment, 66,658,466 tons in 1916, was the product of 233 mines. The average output per mine in 1923, 289,428 tons, exceeded the average of 1916, 286,087 tons, by 3341 tons. In the volume of output per mine the record of the past year shows up better than the banner shipping season of 1916.

Mine development is ahead of actual requirements, so that an increase in ore shipments does not necessitate the opening of new mines, but simply the accelerating of operations at those already opened and equipped.

Shipments were made from 101 mines on the Mesabi range in 1923; from 26 on the Gogebic range; 34 on the Menominee; 24 Marquette; 15 Cuyuna, eight on the Vermillion and two, Mayville-Baraboo range.

A comparison of the average shipment per mine on these ranges, 1922 and 1923, follows:

	1923	1922
Mesabi	414,004	301,671
Gogebic	253,075	230,356
Vermillion	159,824	201,911
Marquette	162,194	117,391
Menominee	142,787	119,074
Cuyuna	85,240	99,841
Lake Superior district	289,428	218,856

A remarkable fact about the record of mine shipments of 1923 is that 38 of the 210 mines account for nearly one-half of all the ore. These 38 mines represent the operations of the Oliver Iron Mining Co., subsidiary of the United States Steel Corp. The proportion of the Oliver company's shipments to the whole is 46.19 per cent. The total of the subsidiary's ore shipments in 1923 was 28,074,771 tons, and, therefore, the average shipment per mine was 736,178 tons. This is about 400 per cent larger than the average for all of the other mines represented in the independent group. It shows how the corporation is obtaining its ore supplies from a comparatively few large and well developed mines.

Fifteen of the Oliver company's mines shipped 24,580,148 tons, or 40 per cent of all the ore forwarded from the Lake Superior district in 1923.

More ore was shipped from the Oliver's Hull-Rust pit in 1923 than in any prior year and more than from any other mine in any year. The shipments totaled 8,823,879 tons, larger than all shipments from any of the

Comparative Shipments by Ranges, 1922 and 1923

	1922	1923	Increase in 1923
Mesabi	28,055,394	41,814,463	13,759,069
Menominee	4,078,519	4,854,781	776,262
Marquette	2,817,390	3,892,666	1,075,276
Gogebic	6,219,610	6,579,950	360,340
Cuyuna	1,497,615	2,220,745	723,130
Vermillion	1,211,467	1,278,598	67,131
Mayville-Baraboo	110,101	138,800	28,699
Totals	43,990,096	60,780,003	16,789,907
By lake	42,613,229	59,036,704	16,423,475
By rail	1,376,867	1,743,299	366,432

Official Record of Iron Ore Shipments from Lake Superior District in 1923 and 1922, Gross Tons

MESABI RANGE

	1922	1923		1922	1923		1922	1923		1922	1923
Aad	8,286	51,506	Fowler	20,560	.....	Majorca	100,816	151,743	Spruce	1,218,983	1,711,204
Adams	468,237	721,098	Genoa	176,484	.....	Margaret	.....	28,164	St. James	636,329	603,761
Ajax	.....	1,445	Glen	447,608	491,256	Mariska	30,263	109,848	St. Paul	.....	353,248
Albany	206,750	281,129	Hanna	.....	40,978	Meadow	39,537	.....	Stevenson	22,197	14,885
Alexandria	203,170	168,551	Harold	247,533	180,278	Mesabi Iron Co.	10,676	83,525	Susquehanna	473,802	617,616
Arcturus	173,297	718,081	Harrison	23,382	55,138	Miller	349,447	138,061	Sweeney	874,336	132,476
Belgrade	102,980	104,376	Harrison Annex	.....	15,045	Minnewas	.....	134,747	Thorne	121,234	85,185
Bennett	605,723	778,232	Hawkins	311,216	752,237	Missabe Mt.	3,174,440	3,933,060	Tioga	75,006	.....
Billings	107,072	188,840	Helmer	.....	3,670	Mississippi	36,578	3,739	Tyler	1,059	18,777
Biwabik	265,662	278,316	Higgins	.....	464	Mohawk	112,699	12,274	Uno North	20,811	30,326
Boeing	250,474	500,127	Hill Annex	758,162	1,098,692	Morris	525,581	906,491	Uno South	39,637	76,097
Bradford	2,775	.....	Hill-Trumbull	350,015	300,359	Morrow (new)	.....	26,717	Utica	201,800	244,215
Brunt	.....	126,192	Hobart	229,088	191,091	Morton	61,959	.....	Victoria	.....	11,750
Burns	21,703	.....	Holman	622,207	793,321	No. Eddy	.....	7,037	Wacootah	59,482	45,654
Burt-Pool-Day	118,508	275,626	Hull-Rust	4,474,326	8,823,879	No. Harrison	497,277	550,815	Wade	.....	35,379
Canisteo	1,120,776	1,350,588	Itasca	22,737	31,240	Patrick	310,223	588,511	Wanless	168,295	111,590
Carson Lake	.....	131	*Julia	10,566	11,566	Pettit	.....	5,009	Warren	101,100	255,873
Chisholm	376,124	320,730	Kerr	559,017	685,618	Philbin	7,085	.....	Webb	129,058	424,638
Cincinnati	37,731	25,411	Kevin	42,450	105	Pilot	87,898	.....	Wellington	61,560	190,260
Clark	141,750	88,742	Kinney	292,893	202,294	Quinn	5,524	2,594	Williams	.....	60,229
Corsica	286,262	245,198	Lamberton	99,853	122,070	Sargent	55,604	121,857	Wisstar	27,095	.....
Crosby	58,153	.....	La Rue	.....	183,307	Schley	.....	74,625	Woodbridge	51,528	
Cyprus	2,914	.....	Laura	142,120	252,734	Scranton	.....	402,716	York	86,558	116,742
Danube	288,933	338,206	Leetonia	147,694	206,797	Sellers	96,009	162,488			
Dean	398,547	428,676	Leonard	400,068	366,670	Shada	.....	74,554	Total	28,055,394	41,814,463
Duncan	5,070	5,317	Leonidas	645,513	642,319	Shenango	187,164	406,016	*Formerly Bessemer; 1923 tonnage from Bessemer stock pile.		
Dunwoody	700,623	717,569	Lincoln	76,225	177,415	**Siphon	.....	26,401	**Formerly Spring.		
Elba	54,135	78,438	Little & Prindle	.....	1,154,702	Sliver	31,549	16,761			
Fault	38,707	.....	Mace No. 2	.....	53,863	Smith	50,175	129,584			
Fay	223,070	138,852	Madrid	13,977	.....	South Agnew	7,978	182,265			
Fayal	330,186	311,214	Mahoning	1,024,696	3,029,865	South Judd	171,034	285,392			

MENOMINEE RANGE

	1922	1923		1922	1923		1922	1923		1922	1923
Aragon	275,464	257,738	Chapin	479,657	539,844	Judson	124,802	69,015	Rogers	193,845	198,787
Balkan	84,952	128,212	Chicagon	48,758	.....	Loretto	88,975	44,523	Spies	35,123	.....
Baltic	138,431	38,791	Davidson	166,372	202,546	Millie	10,327	24,407	Tobin	105,344	49,874
Bates	112,959	49,288	Delta	.....	11,438	Monongahela	114,799	164,025	Tully	62,129	.....
Bengal	163,035	157,255	Florence	.....	25,148	Munro	35,263	.....	Warner	63,152	58,917
Berkshire	118,871	209,994	Fogarty	131,359	81,745	Odgers	55,459	295,885	West Chapin	1,270	3,663
Bristol (Claire)	123,874	455,284	Forbes	.....	118,943	Penn Iron Mining Co.	168,164	383,381	Zimmerman	33,504	51,772
Buck	.....	4,660	Great Western	59,800	.....	Porter	120,802	77,699	Total	4,078,519	4,854,781
Cardiff	28,982	115,433	Hiawatha	126,869	146,257	Richards	.....	17,206			
Carpenter	206,837	132,617	Homer	135,848	231,854	Riverton Group	119,840	211,238			
Caspian	158,021	234,199	James	185,632	63,143						

MARQUETTE RANGE

	1922	1923		1922	1923		1922	1923		1923	2923
Adams (American Mining Co.)	16,632	25,536	Cleveland-Cliffs Group	232,801	557,115	Isabella	109,731	179,498	Princeton(Swanzey)	26,145	25,642
American (Sterling)	40,306	.....	Empire	.....	40,445	Jackson	16,102	12,812	Republic	80,022	169,014
Athens	265,159	187,945	Francis	11,437	.....	Lake Angeline	36,841	.....	Richmond	155,518	271,492
Austin	5,065	94,553	Gardner-Mackinaw	40,180	10,264	Lake Superior	245,694	369,004	Rolling Mill	141,817	176,364
Barnes-Hecker	.....	17,019	Gwynn	26,436	28,529	Maas	11,997	178,772	Stephenson	202,523	74,368
Cambria	.....	141,361	Holmes	262,251	328,193	Maitland	13,593	98,966	Total	2,817,350	3,892,666
			Imperial	73,083	211,302	Mary-Charlotte	172,261	120,319			
						Morris-Lloyd	293,916	210,692			
						Negaunee	337,880	363,461			

GOGEBIC RANGE

	1922	1923		1922	1923		1922	1923		1922	1923
Anvil	30,558	10,104	Eureka	271,840	280,348	Ottawa (Odanah)	121,585	354,280	Tilden	222,603	204,675
Ashland	76,917	38,802	Geneva	13,432	.....	Palms	472,456	334,357	Townsite	59,929	108,564
Asteroid	78,415	108,164	Ironton	267,624	323,404	Plumer	14,434	19,462	Wakefield	430,136	360,501
Berkshire	1,100	2,086	Keweenaw	133,000	176,233	Plymouth	607,854	827,410	Yale (West Colby)	263,667	118,799
Brotherton	69,033	20,889	Minnewawa	6,660	.....	Puritan	69,695	144,531			
Cary	158,325	195,596	Montreal	382,415	450,673	Royal	54,799	2,935	Total	6,219,610	6,579,950
Castile	24,889	19,268	Morgan	.....	28,362	Sunday Lake	190,621	171,583			
Colby	.....	46,140	Newport	788,168	665,503						
Davis (Wis.)	24,124	7,936	Norrie Group	1,385,241	1,559,255						

CUYUNA RANGE

	1922	1923		1922	1923
Armour No. 1	9,359	.....	Maroco	145,472	222,628
Armour No. 2	319,255	285,846	Meacham	14,361	.....
Bonnie-Belle	24,878	47,211	Merritt	.....	24,387
Croft	28	118,564	*Milford	871	76,301
Cuyuna Millelacs	.....	40,223	Pennington	101,767	180,546
Hill Crest	104,336	101,492	Portsmouth	163,927	138,998
Huntington	40,591	.....	Sagamore	197,450	154,570
Ironton	.....	75,653	State Lease	31,808	138,505
Kennedy	144,294	258,723	Total	1,497,615	2,220,745
Mahnomen	199,218	357,098	*Formerly Ida Mae.		

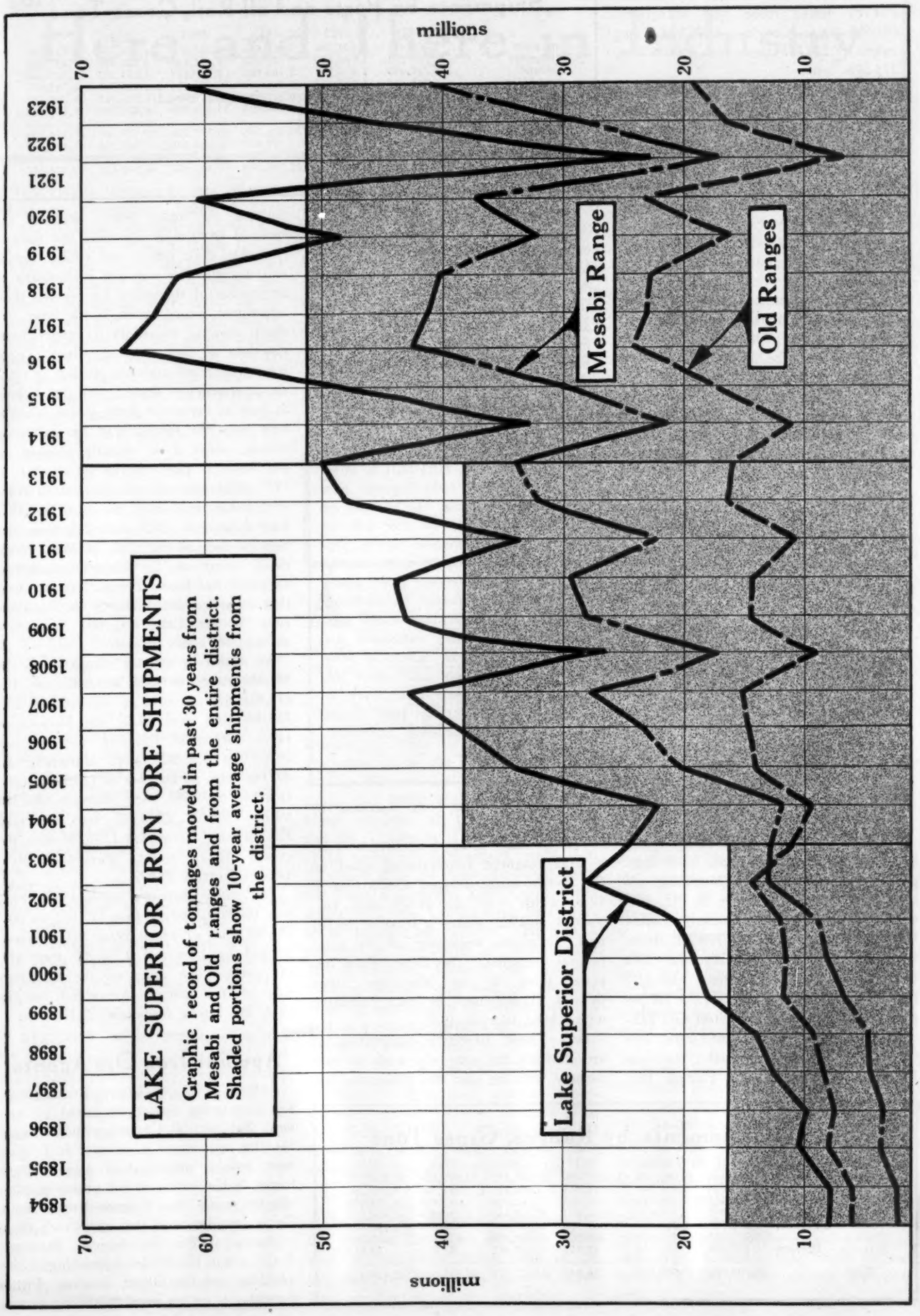
VERMILLION RANGE

	1922	1923		1922	1923
Armstrong Bay	.....	4,748	Section 30	97,857	25,988
Chandler	44,293	76,073	Sibley	51,050	84,877
Consolidated Vermillion	.....	2,782	Soudan	131,479	140,940
Pioneer	634,085	525,160	Zenith	252,703	418,030
			Total	1,211,467	1,278,598

MAYVILLE-BARABOO RANGE

	1922	1923		1922	1923
Cahoon	22,662	27,340			
Mayville	87,439	111,460	Total	110,101	138,800

	1922	1923
GRAND TOTALS	43,990,096	60,780,003


LAKE SUPERIOR IRON ORE SHIPMENTS
Graphic record of tonnages moved in past 30 years from Mesabi and Old ranges and from the entire district. Shaded portions show 10-year average shipments from the district.
Lake Superior District
Mesabi Range
Old Ranges
millions
70
60
50
40
30
20
10
1894
1895
1896
1897
1898
1899
1900
1901
1902
1903
1904
1905
1906
1907
1908
1909
1910
1911
1912
1913
1914
1915
1916
1917
1918
1919
1920
1921
1922
1923

other ranges. For comparison, the total from the Menominee range was 4,854,781 tons; from the Marquette 3,892,666 tons; Gogebic, 6,579,950 tons; Cuyuna, 2,220,745 tons and Vermillion, 1,278,598 tons.

The Steel corporation obtained from this one mine at Hibbing, Minn., an amount of ore that is more than one-half as large as the tonnage obtained by all interests in mines outside of Minnesota in the Lake Superior district. Previously the largest output for one year from the Hull-Rust pit was 7,665,611 tons in 1916.

The Oliver company also shipped a large tonnage of ore in 1923 from the Missabe Mountain mine, a state-owned property that it has developed in recent years. The shipment from this mine was the second largest of any mine in the Lake Superior district, 3,933,060 tons. The company's Spruce mine, also on the Mesabi range, shipped 1,711,204 tons in 1923; the Canisteo 1,350,588 tons while its Little & Prindle mine, one of the few new mines to begin shipping in 1923, forwarded 1,154,702 tons.

A comparison of tonnages shipped since 1908 from Oliver company mines with the percentages that they bear to the totals from the Lake Superior district follows:

Year	Gross tons	Percentage
1923	28,074,771	46.19
1922	19,726,047	44.84
1921	14,056,759	61.65
1920	24,936,073	41.28
1919	22,065,148	45.20
1918	26,178,782	41.66
1917	28,571,977	44.34
1916	31,673,131	47.52
1915	22,518,613	47.63
1914	16,039,654	49.01
1913	24,502,244	49.06
1912	23,845,363	49.46
1911	17,282,499	52.70
1910	21,661,143	40.86
1909	21,397,866	50.36
Total	342,530,070	

Some of the other large mines owned by independents interests made good shipping records in 1923. The Mahoning, operated by Pickands, Mather & Co., forwarded 3,029,865 tons; Bennett, another Pickands, Mather mine, 778,232 tons; Boeing, a property of the Cleveland Cliffs Iron Co.'s mining subsidiary, 500,127; Dunwoody, Tod-Stambaugh Co., 717,569 tons; Hawkins, Wisconsin Steel Co., 752,237 tons; Hill Annex, Interstate Iron Co., 1,098,692 tons; North Harrison, Butler Bros., 550,815 tons; Patrick, Butler Bros., 588,511 tons; St. James, McKinney Steel Co., 603,761 tons; and Susquehanna, Rogers, Brown Iron Co., 617,616 tons. All of the foregoing mines are on the Mesabi range.

Only two properties elsewhere in the Lake Superior district forwarded 500,000 tons or more in 1923. These were the Chapin, Menominee range, with 539,844 tons, and the Norrie group, Gogebic, with 1,559,255 tons, both operated by the Oliver company.

The Mesabi Iron Co., which built a large magnetic concentrating plant on the Mesabi range, shipped 83,525 tons in 1923, which with the 10,676 tons forwarded in 1922, makes a total of 94,201 tons, since the beginning of its commercial operation. The Henry Ford Imperial mine on the Marquette range shipped 211,302 tons in 1923 compared with 73,083 tons in 1922.

IRON TRADE REVIEW's compilation of ore statistics this year was made in conformity with the plan this publication has pursued for many years. Reports are received from mine operators and owners, railroads, dock offices and selling agents, and discrepancies removed preliminary to publication of the year's figures and their subsequent incorporation in the large ore chart showing shipments by mines from the date of their opening. IRON TRADE REVIEW's record excludes ore lost in transit from mines to docks. Ore that is held in dock at the close of the season is withheld from the record until the following season, when it is actually shipped to the buyer. The reports show that in 1923, 1954 tons of ore was lost in transit; 10,825 tons held in dock in 1922 was shipped in 1923, and 215 tons was held in dock at the close of 1923. With these exceptions the record as carried forward by IRON TRADE REVIEW, and that compiled independently at the same time by the Lake Superior Iron Ore association check exactly.

As shown by tabular comparisons, the Mesabi range in 1923 accounts for 41,814,463 tons of ore, an increase of 13,759,069 tons over 1922; the Menominee range forwarded 4,854,781, tons, an increase of 776,262 tons; Marquette 3,892,666 tons, an increase of 1,075,276 tons; Gogebic 6,579,950 tons, increase 360,340 tons; Cuyuna 2,220,745 tons, increase 723,130 tons; Vermillion 1,278,598 tons, increase 67,131 tons; Mayville-Baraboo 138,800, increase 28,699.

The entire district's tonnage for 1923 was 16,789,907 larger than in 1922, or 60,780,003 tons, of which 59,036,704 tons was shipped by lake and 1,743,299 tons all-rail. Only one mine on the Canadian side of the district forwarded ore in 1923, the Moose Mountain, 27,178 tons.

Shipments by Ports and all Rail, Gross Tons

	1923	1922	1921	1920	1919	1918
Escanaba	5,607,411	4,592,354	1,806,656	7,361,070	4,963,358	6,774,969
Marquette	2,789,285	1,976,220	786,946	3,415,108	2,132,935	3,457,054
Ashland	6,237,449	5,813,207	2,264,705	8,180,852	5,915,383	7,565,608
Two Harbors	6,418,464	5,952,437	3,286,338	9,278,464	6,424,545	8,723,472
Superior	17,820,476	11,234,240	4,991,278	14,812,398	10,919,965	14,068,341
Duluth	20,163,619	13,044,771	9,164,803	15,479,334	16,821,209	20,567,288
Total by lake	59,036,704	42,613,229	22,300,726	58,527,226	47,177,395	61,156,732
Total by rail	1,743,299	1,376,867	497,623	1,884,346	1,369,256	1,679,440
Total	60,780,003	43,990,096	22,798,349	60,411,572	48,546,651	62,836,172

Large Ore Chart

IRON TRADE REVIEW'S complete chart of Lake Superior iron ore shipments from the opening of the various mines to date will be ready for distribution in a few weeks. The chart, 28 x 31 inches, is a standard reference work which has proved valuable innumerable times to those companies which subscribe for it. Many companies use a number of these charts in their operating, shipping and sales departments. The new chart may be obtained by addressing IRON TRADE REVIEW, *Penton building, Cleveland, and enclosing* $2.

Iron Ore Shipments by Ranges, Gross Tons

	1923	1922	1921	1920	1919	1918
Mesabi	41,814,463	28,055,394	16,350,696	37,149,277	31,997,699	40,396,711
Marquette	3,892,666	2,817,390	1,116,468	4,608,323	2,992,212	4,355,297
Menominee	4,854,781	4,078,519	1,584,404	6,562,106	4,442,868	6,378,698
Gogebic	6,579,950	6,219,610	2,336,493	8,763,332	6,230,839	7,936,701
Vermillion	1,278,598	1,211,467	869,313	1,007,435	929,049	1,192,908
Cuyuna	2,220,745	1,497,615	488,562	2,191,528	1,861,165	2,478,800
Mayville - Baraboo	138,800	110,101	52,413	129,571	92,819	98,057
Total	60,780,003	43,990,096	22,798,349	60,411,572	48,546,651	62,836,172

Appoint Iron Ore Agents

Buffalo, Feb. 4.—Rogers-Brown Iron Co. announces the appointment of Agnew, Batteiger & Co. as exclusive agent for the sale of its iron ore. J. C. Agnew, who is president of Agnew, Batteiger & Co., through his previous connection with the Rogers-Brown Iron Co. is familiar with the ores which they produces. Offices of Agnew, Batteiger & Co. are in the Widener building, Philadelphia and the Oliver building, Pittsburgh.

Here and There in Industry

Live Information Which Records the Expansion of Various Lines of Productive Enterprise

FURTHER extensions are planned by the Youngstown Boiler & Tank Co., Youngstown, and its subsidiary, the Youngstown Boiler & Tank Co. of Texas. Floor space during the past year was enlarged about one-third and increased operations have taken up the additional facilities. J. P. Keene was re-elected president at the recent annual meeting of the directors. R. I. Ingalls was re-elected vice president and C. R. Vogel, secretary and treasurer. The officers and Philip Wick, Youngstown, and R. D. Patterson, Dayton, O., are directors.

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WELDING equipment consisting of three gasoline engine driven welding machines and welding wire were furnished recently by the Wilson Welder & Metals Co., 132 King street, New York, to the George S. Curtiss Co. for erecting two 80,000-barrel oil storage tanks for the Sinclair Refining Co., at Tremley Point, N. J. The tanks are 117 feet in diameter, 42 feet high and the entire bottoms and roofs will be electrically welded.

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THE Pawling & Harnischfeger Co., Milwaukee, manufacturer of excavators, cranes, and machine tools, has made the following changes in its personnel: N. B. Norris, formerly district manager at New Orleans, now is district manager of the office at Memphis, Tenn.; D. J. Murphy, formerly at New Orleans office, now is district manager of the Texas district with headquarters at Dallas, Tex.; W. J. Dugan, southern sales manager, now is in charge of the entire southern territory with headquarters at Memphis.

* * *

ERECTION of a building for the special use of constructing road rollers and other heavy road making machinery was completed recently by the Galion Iron Works & Mfg. Co., Galion, O. The new unit is 400 feet long, 112 feet wide, with a 60-foot crane runway through the center. The building was constructed of steel, glass, brick and concrete, with wood block flooring. Equipment for the plant is practically all purchased. Together with the old building, the plant now is one of the largest manufacturers in the country producing road rollers, road machinery, culvert pipe and other road makers' supplies.

* * *

STRUTHERS Furnace Co., Struthers, O., at its recent annual meeting re-elected officers for the new year as follows: President, W. C. Runyon Sr., vice president, W. C. Runyon Jr.; secretary and treasurer, Albert Grossman; assistant secretary and treasurer, R. H. Domer. The directors re-elected were the first three officers and A. B. Stough, L. S. Baldwin, J. G. Richards, H. W. McIntosh, and Messrs. Yeomon and Hagen.

* * *

SAMUEL MONKS, production manager of Atlantic Screw Works, Inc., Hartford, Conn., was elected assistant secretary of the company at the recent annual meeting of the directors. All other officers and directors were re-elected. The officers are: President and treasurer, Fred N. Tilton; vice president, A. W. Bowman; secretary, M. F. Miner.

Obituaries

ALEXANDER L. HOERR, chief engineer of the National Tube Co.'s plant at McKeesport, Pa., and an active member and former president of the Engineers' Society of Western Pennsylvania, died Jan. 28 in his home in that city at the age of 50 years. Mr. Hoerr was born on the South Side, Pittsburgh, June 18, 1873, and was graduated from the engineering school of the Western University of Pennsylvania in 1895, his earlier education being received at the Park institute and the University of Pittsburgh. Prior to going to McKeesport, more than 18 years ago, he was connected with the Jones & Laughlin Steel Corp., Pittsburgh, and the Lackawanna Steel Co., in an engineering capacity. He was a member of the board of directors of the McKeesport hospital, of the McKeesport Rotary club and of the City Planning commission of McKeesport, as well as a charter member of the Youghiogheny Country club.

* * *

Robert F. Rasmussen, general superintendent of the C. A. Libbey Mfg. Co., Oshkosh, Wis., manufacturer of farm tools, died of heart disease while visiting at Pensacola, Fla., on Jan. 25.

* * *

Howard R. Hughes, president of the Hughes Tool Co., Houston, Tex., died in his office there Jan. 14, at the age of 54 years. Mr. Hughes was graduated from Harvard law school in 1897 and admitted to the bar shortly afterward.

* * *

Homer B. Belfield, purchasing agent for Billings & Spencer Co., Hartford, Conn., manufacturer of drop forgings, tools and forging machinery, died at the Hartford hospital Jan. 14, at the age of 57 years. He had been with the Billings company for 28 years, for 15 of which he had been purchasing agent.

* * *

Prof. Henry Carmichael, inventor and originator of the process of copper mining which has contributed to the success of many copper mines, died Jan. 29 at his home in Malden, Mass. He was born in Brooklyn, N. Y., in 1846, the son of Daniel Otis Carmichael who was also an inventor. Prof. Carmichael was a graduate of Amherst college and for many years professor of chemistry and allied sciences at Bowdoin college.

* * *

Lenox Smith, former president of Standard Roller Bearing Co. died Jan. 25 in his home at Valley Stream, L. I. Mr. Smith was born 80 years ago and was a grandson of Edward Smith, a founder of the Cambria Iron Co. He was graduated from Columbia college in 1865 and from the Columbia school of mines in 1868, and held prominent connections in the mining and railroad field. Mr. Smith served in the Union armies during the civil war.

Men of Industry

Personal News of a Business Character Pertaining to the Iron and Steel and Related Fields of Enterprise

ALFRED C. HOWELL has been elected to succeed Hobart Ames as president of the Ames Shovel & Tool Co., Boston, and will assume his new duties Feb. 15. Mr. Howell for many years has been well known in the steel industry, and resigns as plates sales agent of the Bethlehem Steel Co. to go with the Ames company. In 1897 he served his apprenticeship as an office boy and later as a stenographer at the Homestead Steel Works and later at the Pittsburgh office of the Carnegie Steel Co. From 1901 to 1910 he was a clerk in the structural sales department of the Carnegie Steel Co., Pittsburgh, and from 1910 to 1915 was chief clerk of the Cincinnati sales offices of the Tennessee Coal, Iron & Railroad Co. and the Carnegie Steel Co. For the next three years Mr. Howell served as manager of the steel department of the W. Bingham Co., Cleveland. In 1919 he became manager of the structural division of the sales department of the Midvale Steel & Ordnance Co. and the Cambria Steel Co., Philadelphia. In 1921 he was appointed manager of sales for these companies in the Philadelphia district. When the Bethlehem Steel Co. acquired the Midvale and Cambria companies he was appointed to the post with the Bethlehem company which he now is leaving. As president of the Ames Shovel & Tool Co., Mr. Howell will have his headquarters in the Ames building, Boston.

Mr. Ames resigned as president of the Ames Shovel & Tool Co. after having served nearly 23 years in that capacity. He will remain as director of the company but intends to devote more of his time to his private interests.

* * *

H. P. Pope resigned as western representative of the Thomas Spacing Machine Co., Pittsburgh, manufacturer of punches, drills, shears, tables, etc. Chicago headquarters are at 936 Monadnock block.

* * *

H. H. Hammond, secretary and treasurer of McMyler-Interstate Co., Cleveland, resigned as of Jan. 1. He has been connected with the company for more than 20 years, having been treasurer of the McMyler Mfg. Co. before it was merged into the present company.

* * *

Charles H. Wagner, recently appointed sales manager of the American Fork & Hoe Co., Cleveland, formerly

ALFRED C. HOWELL

was assistant sales manager for that company. He was appointed to his new position to fill the vacancy caused by the death of Cyrus Reimer.

* * *

Ralph E. MacDonald recently has been appointed sales manager of the Savage Mountain Fire Brick Co., Frostburg, Md. Mr. MacDonald succeeds Clarence Overend, and will have his headquarters at 1001 Federal Reserve building, Pittsburgh.

* * *

Edward M. Griffith has been appointed sales manager of the Standard Gauge Steel Co., Beaver Falls, Pa., manufacturer of cold-drawn steel, finished steel specialties, etc. Mr. Griffith had been connected previously with the Crucible Steel Co. of America for approximately 15 years in an operating and sales capacity.

* * *

William R. Webster was elected president of The American Tube & Stamping Co., Bridgeport, Conn., manufacturer of hot and cold rolled strip steel, at its recent annual meeting. He succeeds Edmund C. Mayo, who resigned in November to become vice president of the Gorham Mfg. Co., Providence, R. I.

F. Kingsbury Curtis was elected chairman of the board at the annual meeting. Ellis M. Johnston, elected vice president and treasurer was connected formerly with the American Rolling Mill Co., Middletown, O., as its western district manager.

E. W. Harrison now is taking a short vacation in Europe. On his return he probably will resume active connection with the company in a special representative capacity.

* * *

A. H. Ferbert, recently elected vice president of the Pittsburgh Steamship Co., has been connected with that company since 1904. He succeeds A. F. Harvey who was made president following the recent resignation of Harry Coulby. Mr. Ferbert started in the auditing department of the company and later was in the furnace end of the business. For many years he directed the movement of the ore sent by the United States Steel Corp. In 1922 he succeeded E. C. Collins as traffic manager when the latter resigned to join the Crucible Steel Co. of America.

* * *

William L. Saunders, chairman of the naval consulting board and deputy chairman of the federal reserve bank, New York, has been elected president of the United Engineering society. Mr. Saunders is chairman of the board of the Ingersoll-Rand Co. and a director of other large corporations. He is a past president of the American Institute of Mining and Metallurgical Engineers, the New York chamber of commerce, and the American Manufacturers Export association. George H. Pegram, chief engineer of the Interborough Rapid Transit Co., New York, and a past president of the American Society of Civil Engineers was chosen first vice president; J. V. W. Reynders, vice president of the American Institute of Mining and Metallurgical Engineers was named second vice president.

Buying of Machinery Increases

General Electric and Westinghouse Closing on Recent Lists—National Tube Co. Is Inquiring for Approximately 50 Tools—Used Machinery Market Is Active—Buyers Holding Up on Crane Purchases

A HEALTHY condition generally is noted in nearly all centers of the machine tool and shop equipment market, with large lists being brought out from time to time and inquiries for one or two tools showing up in a satisfactory volume. Several buyers, who have had lists up for figures for some time, are starting to close, and other buyers may place orders for the bulk of their large lists soon. Many dealers found the business for January exceeded expectations.

Prospects for a good business with the railroads appear bright, with several roads having lists already out and others expected to follow with substantial inquiries. The New York Central has added to its list and inquiries are out from the Santa Fe and Chicago, Milwaukee & St. Paul. Lists are expected from the Southern, Burlington, Illinois Central, Atlantic Coast Line, Sante Fe, Baltimore & Ohio and Northern Pacific.

The General Electric Co. is buying for its Philadelphia shops in a substantial way. Other industrial buyers include Ingersoll-Rand Co., Phillipsburg, N. J.; the Pullman Co., Chicago; the Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.; and the Norfolk & Western. The National Tube Co. is asking for figures on 30 miscellaneous machines and 20 lathes for the Gary, Ind., mills.

Business continues good in the second hand machinery market and inquiries are keeping up. While inquiries for cranes are good, actual buying seems to be delayed. Demand for handpower cranes features the market.

Substantial Inquiries Expected from Railroads

NEW YORK, Feb. 5.—Substantial buying by the General Electric Co. for its West Philadelphia plant features the eastern machine tool market. This business is being distributed among several sellers, and comprises miscellaneous standard equipment. Among the leading items is said to be a list of 12 or more milling machines; a 14-foot planer went to an eastern builder.

The New York Central during the past week has further extended its list, fully 15 machines being added. These include a drill press, a hydraluic punch and several shapers, lathes and planers. This railroad is closing slowly, and it now is understood that buying against the pending list may extend over into April. The Atlantic Coast line is expected to bring out a substantial list shortly. This belief is strengthened by the recent purchase by this railroad of four sizable electric overhead cranes. The Southern railroad is expected to come into the market with its contemplated list for Birmingham at any time. The Southern Pacific, 165 Broadway, is inquiring for a band saw.

Substantial lists for the Burlington, Illinois Central and Santa Fe are reported here as under contemplation. An interesting order of the past week calls for a 30-foot planer for the Phillipsburg, N. J., plant of the Ingersoll-Rand Co., this business going to an eastern builder, who also has recently booked two axle lathes and three car wheel borers for the Pullman Co., Chicago. One dealer here has just closed on two planers for Colombia and one milling machine for Spain.

While new inquiries for locomotive cranes are more numerous, sellers assert that several are purely for estimating purposes and at the moment do not look like bonafide business. The locomotive crane industry is now said to be operating on an average of around 60 per cent of capacity, this being a slight improvement over the first part of the year. Demand for handpower cranes continues a feature. Inquiries for this equipment are coming out freely. Revival in electric overhead crane business continues slower.

Market Is Quiet

CLEVELAND, Feb. 5.—Business in this territory in the machine tool and shop equipment market seems to be lagging. Dealers state that while reports of fair sized inquiries are coming from other distributing centers, large lists are not up in this district. Little railroad activity is to be found, the additions to the New York Central list being the only new inquiry reported here. During the week the Norfolk & Western bought one tool, the order being placed with a dealer at Cincinnati.

Buying by automobile dealers in the Detroit territory has fallen off somewhat. At present a few orders are being placed for tools for replacement purposes, buying being confined to single orders in the majority of cases. It is thought that if production schedules are maintained as planned, a buying movement by these interests will be noted in the near future.

However, several dealers report a good business on lists of one or two items and state that inquiries of this nature continue in a good quantity. One dealer reports that business for January exceeded that realized during the corresponding month in 1923. Business in the second hand market continues good, while a slight lull is noted in crane sales although inquiries are numerous.

Railroads Bring Out List

CHICAGO, Feb. 5.—The Atchison, Topeka & Santa Fe railroad will open bids, Feb. 12, on 43 tools, including five 20-inch upright sensitive drills, motor driver; one upright 24-inch sensitive drill press, motor driven; one heavy duty vertical press, motor driven; one two-spindle independent drill; one 4000-pound double frame steam hammer; one swedging machine; one single pneumatic flue welding machine; one draw cut hack saw; one 21-inch x 6-foot and 25-inch x 7-foot 6-inch heavy duty turret lathes, motor driven; 12 double wet emery grinders; one 12 x 40-inch universal grinding machine; one drill grinder; one turret lathe, motor driven; one flat turret lathe, one 2 x 24-inch flat turret lathe; two 18½-inch x 6-foot cabinet brass turret lathes; four 20-inch x 8-foot heavy duty geared head motor driven engine lathes; one 36-inch x 16-foot heavy duty

engine lathe; one nut facing machine; one 7-foot triple geared full universial drill press, motor driven; one 36-inch x 16-foot upright drilling and tapping machine; one 6-foot triple purpose plain drilling and tapping machine; one radial drill; one single pneumatic flue welding machine; and one draw cut back saw with swivel vise that swings both ways. These tools, it is understood, are on a general list which does not include equipment for the new Santa Fe shops at San Bernardino, Cal.

The Chicago, Milwaukee & St. Paul railroad is in the market for five 24-inch engine lathes, three turret lathes, six 32-inch crank shapers, two 44-inch boring mills, a 36-inch vertical turret lathe, one 26-inch crank planer, three drill presses, three 36-inch punch and shears, two steam hammers of 1100 and 1500 pounds, and other tools. John T. Schroeder, Hartford, Wis., is inquiring for machinery for a handle and wagon stock factory. An Iowa manufacturing company has placed a 20-inch drill press, a shaper 16 inches by 6 feet, and two lathes with a Chicago machinery dealer. One company has booked two large turret lathes. One machinery house reports that its business in the last eight days has been greater than in any one month last year. Most houses report fair business off their floors. The Nash Motors Co., Milwaukee and Kenosha, Wis., has taken over the Mitchell Motor Car Co. plant at Racine, Wis., and it is understood the heavy production machinery in the plant went with it. Whether Nash will be in the market for tools is not yet known.

National Tube Inquires

PITTSBURGH, Feb. 5.—Formal inquiry by the National Tube Co., for about 30 different machines such as milling machines, vertical boring mills, lathes, planers, radial drills, increased late last week by the addition of 20 lathes, all for the Gary tube plant, Gary, Ind., furnished the feature of last week's machine tool market. It is understood now that most, if not all of the 50 items, will be purchased soon for quick shipment. The Westinghouse Electric & Mfg. Co., has been active in purchasing items here and there for its different service departments, but action on the large list for East Pittsburgh still is deferred.

The Standard Steel Car Co. now has a list out involving about 12 wood-working machines and a user in Altoona, Pa., wants six wood-working machines for a pattern shop. Spasmodic sales, mostly of single items, continue to be noted each week, one house disposing of a 72-inch boring mill this week to an out-of-town user.

The used machinery market is active as to inquiry but sales continue to involve one or two tools at a time for the most part. A forging company has bought a press, a user in Ohio bought a lathe or two and some saws and other items have been disposed of to nearby manufacturers. One in New England bought a press. A buyer from the South was in town last week endeavoring to locate 10 or 12 good used machines. Many inquiries are current for large items which dealers find difficult to locate. Several single crane orders are noted together with one or two for groups of hoists.

Demand Progresses Slowly

BOSTON, Feb. 5.—Sales of machine tools while not brisk continue to show improvement and inquiry before the trade points to better business in February than in January. The long list of tools for an East Boston plant still is before the trade. It is rumored that part of this list will be covered with used equipment. The whole negotiation is expected to be closed within a week or 10 days.

Inquiry comes principally from automobile part manufacturers although paper mills and even textile mills are commencing to inquire for a few scattered tools. A textile machine manufacturer has placed an order for equipment which totals about $10,000. An electrical goods manufacturer is in the market for a large boring machine and some other equipment. Sales of new tools include several screw machines and some special plate working equipment. Prices are unchanged. The used tool market is spotty.

Crane Awards and Inquiries of the Week

Orders Placed

One 22-ton standard gage steam operated locomotive crane for American Creosoting Co., New Orleans, to the Orton & Steinbrenner Co., Chicago.

One 5-ton electric traveling crane for J. L. Mott Co., Trenton, N. J., to the Whiting Corp., Harvey, Ill.

One 10-ton and one 5-ton handpower and one 7½-ton electric traveling cranes for Austin Co., Philadelphia, on behalf of clients, to the Whiting Corp., Harvey, Ill.

One 8-ton handpower crane for Northern States Power Co., St. Paul, to the Whiting Corp., Harvey, Ill.

One 15-ton electric traveling crane for Oliver Iron Mining Co., Duluth, to the Whiting Corp., Harvey, Ill.

One 60-ton electric traveling crane for Phoenix Utility Co., New York, to the Whiting Corp., Harvey, Ill.

One 100-ton electric traveling crane and one 35-ton handpower crane for United Light & Railway Co., Davenport, Iowa, to the Whiting Corp., Harvey, Ill.

One 10-ton crane to the Shaw Electric Crane Works, Muskegon, Mich., for the McClintic-Marshall Co., Pottstown, Pa.

One 8-ton hand power crane for the Northern Steam & Power Co., Chicago, to the Whiting Corp.

One 10-ton hand power crane for the Todd Shipyards Corp., New York, to the Whiting Corp., Harvey, Ill.

One used 23-ton McMyler locomotive crane, 45-foot boom, for the Hart & Crouse Co., Utica, N. Y., to Philip T. King, 30 Church street, New York.

Two 5-ton electric cranes, 37-foot span, for the American Fabricated Steel Co., Philadelphia, to Alfred Box & Co., Philadelphia.

Two 3-ton cage controlled electric cranes, 30-foot span, for the Electric Storage Battery Co., Crescentville, Pa., to alfred Box & Co., Philadelphia.

One 10-ton electric crane, 48-foot span, for the Sheffield Foundry Co., Chicago, to Alfred Box & Co., Philadelphia.

Conveyor installation, costing approximately $85,000, for the handling of sand and molds for the Warren, O., plant of the General Fire Extinguisher Co., Providence, R. I., to the Lamson Co., Boston.

Four electric overhead cranes for the Atlantic Coast Lines, to an eastern builder; specifications call for one 25-ton and one 15-ton crane, each with 57-foot span; and two 10-ton cranes with spans of 67 and 33 feet respectively.

One used, 20-ton Industrial locomotive crane, 50-foot boom, for the Bay Ridge Cement Co., Cleveland, to Philip T. King, Inc., 30 Church street, New York.

Three 30-ton locomotive cranes equipped pile driver, for the Lehigh Valley railroad, to Industrial Works, Bay City, Mich.

One 25-ton locomotive crane for the Diamond Match Co., Chico, Calif., to the American Hoist & Derrick Co., St. Paul.

One hand power jib crane with 21-foot radius for the Baltimore & Ohio railroad, to the Whiting Corp., Harvey Ill.

Six hoists for the American Brake Shoe & Foundry Co., Chicago, to the Whiting Corp., Harvey, Ill.

One 20-ton locomotive crane for the Yonkers Builders Supply Co., Yonkers, New York, to the Browning Co., Cleveland.

One 10-ton electric crane, 28-foot span, purchased through the Byllesby Engineering Co., Chicago, for the Northern States Power Co., from the Whiting Corp., Harvey, Ill.

One jib crane for a Barberton, O., concern to the Whiting Corp., Harvey, Ill.

One 2-ton single I-beam electric crane, 28-foot span, for the Co-operative Foundry Co., Rochester, N. Y., to the Shepard Electric Crane & Hoist Co., Montour Falls, N. Y.

Orders Pending

Two 15-ton cranes for Duquesne Works, Carnegie Steel Co., together with various other overhead electric traveling and locomotive cranes wanted by the same company for different points; early action anticipated.

Cranes for one plant of the American Sheet & Tin Plate Co., Pittsburgh; orders expected to be placed this week.

Six 5-ton cranes for the Standard Sanitary Mfg. Co., Baltimore, Md., five for the foundry and one for the machine shop, orders to be placed within week or two.

Dock cranes for the Memphis, Tenn., dock of the Wheeling Steel Corp., Wheeling, W. Va., early inquiry expected.

One 25-ton locomotive crane for the Bessemer & Lake Erie railroad, Greenville, Pa.; order about to be placed.

Several electric overhead cranes for the proposed Birmingham, Ala., shops of the Southern railroad; specifications expected out shortly.

One 25-ton, 4-motor crane, 25-foot span, for the Wilkesbarre, Pa., shops of the Lehigh Valley railroad, pending; it is understood that action on the 30-ton gantry for the Hazelton, Pa., shops, pending for a long time, will be taken simultaneously.

Seven handpower overhead cranes to the New York Central railroad six of 1-ton capacity, and one of 2-ton capacity; bids closed.

One 10-ton locomotive crane for the Florida East Coast, bids asked.

Recent Industrial Business Changes

AFTER May 1 the following iron and steel companies will have Chicago offices located in the new Straus building, that city; Pittsburgh Steel Co., Pittsburgh Steel Products Co., National Fabric Co., T. H. Symington Co., Miami Metals Co., Freyn, Brassert & Co., and Brassert Tripp & Hardy.

* * *

General Metal & Copper Corp., New York, has changed its name to General Copper Co.

* * *

Tacoma Spring Co., Tacoma, Wash., has changed its name to Drashall Steel Products Co., with offices at 1213 A street that city.

* * *

McClellan & Junkersfeld, Inc., engineer and architect, has removed its home office to 68 Trinity place, New York, as of Feb. 1.

* * *

The Nobel Machinery Co., Inc., 3 Howard street, New York, has moved to its new offices at 239 LaFayette street, that city.

* * *

Great Western Smelting & Refining Co. will move into its new plant in Detroit about March 1. J. B. Neiman is manager.

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Hudson Mfg. Co., Minneapolis, manufacturer of farm machinery, plans merging of plants at Janesville and DePere, Wis.

* * *

Ohio Locomotive Crane Co., Bucyrus, O., will move its New York offices from the fifteenth floor to room 425, 30 Church street.

* * *

Sale of the Monitor Stove Co., Cincinnati, by order of receiver, will cause plant to be reopened and operated shortly.

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Westco-Chippewa Pump Co., incorporated in Delaware, has taken over the Western Pump Co., Davenport, Ia., and the Chippewa Pump Co., Chippewa, Wis.

* * *

The C. Spiro Mfg. Co., manufacturer of automobile parts and accessories, has moved from 68 East 131st street, New York, to Dobbs Ferry, N. Y.

* * *

The Lake Superior District Power Co. has purchased the steam electric generation station at Wakefield, Mich., from the M. A. Hanna Co.

* * *

Harvey H. Brown & Co. and The Stewart Furnace Co., announce the removal of their offices from 1335 Rockefeller building to 1854 Union Trust building, Cleveland, as of Jan. 31.

* * *

The Brown-Hutchinson Iron Works, Michigan corporation, has qualified to do business in Indiana with $25,000 capitalization. Ralph S. Feig, Mishawaka, Ind., is agent for that state.

* * *

The Mianus Motor Works, Inc. and the Mianus Diesel Engine Co., Inc., both of Stamford, Conn., have been merged under the name of the Diesel Engine Co., with a capital of $10,000.

* * *

Unit Motor Co., 2615-9 Walnut street, Kansas City, Mo., manufacturer of motors, screw machine products, and automobile parts, will move into new quarters about April 1, at Fourteenth and Chestnut streets, that city.

* * *

The Shepard Electric Crane & Hoist Co., 30 Church street, New York, has opened offices in Detroit at 5-124 General Motors building. J. D. Gillette is district manager and Harold Aber his assistant.

* * *

Andrew Kopperud Co., 3801-11 Lapham street, Milwaukee, manufacturer of steel and malleable forgings, tools, etc., has been incorporated to continue business formerly operated as proprietorship.

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H. J. Ness Mfg. Co., 48 Howard street, New York, manufacturer of electric spot welders, has appointed John E. Cobaugh, Stephen Girard building, 21 South Twelfth street, Philadelphia, as its representative in that territory.

* * *

The Metal Wares, Ltd., Alexandria, Ont., has purchased the plant of Schell Foundry & Machine Co., that city, and also the equipment of the Leslie Tinware Co., Ottawa, Ont. Equipment will be moved from Ottawa to Alexandria. F. A. Leslie is vice president.

* * *

The Washington Motors Co. is moving its plant to its new site on South Yankee road along the Baltimore & Ohio railroad tracks, Middletown, O., from its present location in Eaton, O. Company manufactures steam passenger automobiles.

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Standard Turbine Corp., Scio, N. Y., manufacturer of steam turbines, has opened a San Francisco office where it will be represented by Halloran & Golcher. An Omaha office also has been opened, Industrial Sales & Engineering Co. being representative there.

* * *

Academy Shops Mfg. Co., Troutman, N. C., has changed its name to the Carolina Iron Works, Inc., and changed its location to Mooresville, N. C. The company conducts a trade school and manufactures iron and steel products. The same officers and directors were retained by the newly named company.

* * *

Deline & Elmes, 25 Church street, New York, has just been organized to deal in hoisting equipment and general contractors' supplies and has been appointed representative of the National Hoisting Engine Co., Harrison, N. J. Mr. Deline at one time was chief engineer of the National Hoisting Engine Co., and for several years was president of the Deline Engineering Co., Brooklyn. Mr. Elmes has been identified with the conveying equipment industry for more than 15 years, during which he was associated with the Brown Hoisting Machinery Co., Cleveland, and the Byers Machine Co., Ravenna, O.

Construction and Enterprise

Concise and Timely Business Building Opportunities from the Field of Industry

SAN FRANCISCO—The Ferromanganese Co. has been incorporated to handle manganese ores and their products. Company owns and operates extensive mining properties in Stanislaus county and is equipping plant in Berkeley for conversion of ores. Arthur P. Holland is president, Robert C. Oliphant vice president, and Herbert W. Erskine secretary. Offices of the company are located at 341 Montgomery street.

WATERBURY, CONN.—American Republican, Inc., will build 4-story, brick, steel and concrete, 60 x 100-foot plant costing about $150,000.

CHICAGO—The Crawford Steel Co., 341 North Crawford avenue, has been incorporated for $50,000 to manufacture and deal in merchandise and steel by Richard W. Paltridge, Hilda J. Partridge and Brice A. Buckingham.

CHICAGO—Elbe Tool & Die Co., Inc., 315 North Wood street, has been incorporated for $7000 to manufacture and deal in metal and wooden products, etc., by Otto Elbe, Otto Elbe Jr., and George L. J. Nierman.

CHICAGO—Thermo Individual Laundry Corp., 1530, 140 South Dearborn street, has been incorporated for $50,000 to manufacture and deal in laundry machinery, by William V. Rifle, E. G. Murphy and Henry Donahue.

CHICAGO—Coleman Hardware Co., 952 North Michigan avenue, has been incorporated for $150,000 to manufacture and deal in builder's hardware, steel and iron products, etc., by Clay Judson, J. E. Hauronic, and M. E. Burgess. Company does not plan erection of building or purchase of additional equipment.

CHICAGO—Compo Set Mfg. Co., 2911 West Lake street, has been incorporated for $100,000 to manufacture and deal in metal store fronts, machinery, implements, etc., by F. B. Liddell, W. C. Liddell and William R. Tribbey.

CHICAGO—Jensen, Nehls & Co., 3601 West North avenue, has been incorporated with 100 shares no par value stock, to manufacture and deal in mill supplies, foundry and factory supplies and hardware, by R. H. Nehls, Stuart Aagaard, and H. G. Jensen.

CHICAGO—National Art Bronze Works, 1934 West North avenue, has been incorporated for

(*Continued on Page* 448)

Warehouse Steel Prices

Quotations in Cents Per Pound at Leading Market Centers

STEEL BARS

Boston	3.515c
Buffalo	3.55c
Chicago	3.20c
Cincinnati	3.40c to 3.50c
Cleveland	3.36c
Detroit	3.35c
Los Angeles	4.25c
New York	3.54c
Philadelphia	3.47c
Pittsburgh	3.15c
San Francisco	3.75c
Seattle	3.75c
St. Louis	3.35c
St. Paul	3.45c

IRON BARS

Boston	3.515c
Buffalo	3.50c
Chicago	3.20c
Cincinnati	3.40c to 3.50c
Detroit	3.35c
New York	3.54c
Philadelphia	3.47c
St. Louis	3.35c

SHAPES, STRUCTURAL

Boston	3.615c
Buffalo	3.65c
Chicago	3.30c
Cincinnati	3.50c to 3.60c
Cleveland	3.46c
Detroit	3.45c
Los Angeles	4.10c
New York	3.64c
Philadelphia	3.57c
Pittsburgh	3.25c
San Francisco	3.60c
Seattle (large shapes)	3.75c
St. Louis	3.45c
St. Paul	3.55c

PLATES

Boston	3.615c
Boston, 3/16-inch	3.04c
Buffalo	3.65c
Chicago	3.30c
Cincinnati	3.50c to 3.60c
Cleveland	3.46c
Detroit	3.45c
Detroit, 3/16-inch	3.45c
Los Angeles	4.00c
New York	3.64c
Philadelphia	3.57c
Philadelphia, 3/16-inch	3.82c
Pittsburgh	3.25c
San Francisco	3.75c
Seattle	3.75c
St. Louis	3.45c
St. Paul	3.55c

NO. 10 BLUE ANNEALED SHEETS

Boston, 3/16-inch	4.515c
Buffalo	4.30c
Chicago	4.00c
Cincinnati	4.10c
Cleveland	3.60c to 4.06c
Detroit	4.15c
Los Angeles	5.00c
New York	4.34c
Philadelphia	4.10c
San Francisco	5.00c
Seattle	5.00c
St. Louis	4.10c
St. Paul	4.25c

NO. 28 BLACK SHEETS

Boston	5.00c
Buffalo	5.00c
Chicago	4.70c
Cincinnati	4.90c
Cleveland	4.50c to 4.65c
Detroit	4.85c
Los Angeles	6.20c
New York	4.50c to 4.70c
Philadelphia	5.15c
San Francisco	5.80c
Seattle	6.00c
St. Louis	4.75c
St. Paul	4.95c

NO. 28 GALVANIZED SHEETS

Boston	6.00c
Buffalo	6.10c
Chicago	5.85c
Cincinnati	5.90c
Cleveland	5.60c to 5.80c
Detroit	6.00c
Los Angeles	7.00c
New York	5.50c to 5.70c
Philadelphia	6.25c
San Francisco	6.50c
Seattle	7.00c
St. Louis	5.75c
St. Paul	5.75c to 6.00c

BANDS

Boston	4.315c
Buffalo	4.35c
Chicago	3.95c
Cincinnati	4.00c to 4.10c
Cleveland	4.01c to 4.16c
Detroit	4.10c
Los Angeles	4.90c
New York	4.39c
Philadelphia	4.27c
Pittsburgh	3.95c
San Francisco	4.50c
Seattle	4.75c
St. Paul	4.20c

HOOPS

Boston	5.80c
Buffalo	4.65c
Chicago	4.55c
Cleveland	4.01c to 4.16c
Detroit	4.95c
New York	5.19c
Philadelphia, 1 inch and wider	
20 gage and heavier	4.27c
Pittsburgh	3.95c
Seattle	5.50c
St. Paul	4.80c

COLD ROLLED STEEL

Boston (rounds)	4.35c
Boston (shapes)	4.85c
Buffalo (rounds)	4.45c
Buffalo (shapes)	4.95c
Chicago (rounds)	4.00c
Chicago (shapes)	4.50c
Cincinnati (rounds)	4.25c
Cincinnati (shapes)	4.75c
Cleveland (rounds)	4.10c
Cleveland (shapes)	4.60c
Detroit (rounds)	4.30c
Detroit (shapes)	4.80c
Los Angeles (rounds)	5.60c
New York (rounds	4.40c
New York (shapes)	4.90c
Philadelphia (rounds)	4.35c
Philadelphia (shapes)	4.85c
Pittsburgh (rounds)	4.05c
Pittsburgh (sq. hex. and flats)	4.55c
San Francisco (rounds)	5.50c
Seattle (rounds)	5.50c
St. Paul (rounds)	4.25c

WELDED PIPE

Discounts from warehouse, New York City

Standard Steel Pipe

	Black	galvanized
¼-⅜-inch butt	—31	+ 2
½-inch butt	—41	—24
¾-inch butt	—46	—32
1/3-inch butt	—48	—34
3½-6-inch lap	—44	—30
7-8-inch lap	—41	—11
9-10-inch lap	—35	— 8
11-12-inch lap	—34	— 6

Wrought Iron Pipe

	Black	galvanized
¼-⅜-inch butt	+44	+78
½-inch butt	— 4	+19
¾-inch butt	—11	+ 9
1-1½-inch butt	—14	+ 6
2-inch lap	— 5	+14
3-6-inch lap	—11	+ 6
7-12-inch lap	— 3	+16

Bourne-Fuller Service

includes immediate shipment of all Iron and Steel materials from Cleveland and Cincinnati

Warehouses

If you are not receiving our Stock-list we shall be glad to send it to you regularly upon request.

Upson Works

Open Hearth Steel Bars for special uses. Also a complete line of Bolts and Nuts. Prompt Shipments.

THE
BOURNE-FULLER CO.
Iron, Steel
Pig Iron
Coke

CLEVELAND

New York **Chicago**
San Francisco
Cincinnati **Detroit**

Iron and Steel Prices

Iron Ore

LAKE SUPERIOR ORES
Per Gross Ton Lower Lake Ports

Old range bessemer, 55 per cent iron.$6.45
Mesabi bessemer, 55 per cent iron.... 6.20
Old Range nonbessemer, 51½ per cent iron 5.70
Mesabi nonbessemer, 51½ per cent iron 5.55

EASTERN LOCAL ORES

Cents per unit delivered at Eastern Pennsylvania and New Jersey furnaces
Foundry and basic, 53 to 63 per cent ..... 10.00 to 11.00
Copper free low phosphorus 53 to 65 per cent ..... 13.25 to 16.50

FOREIGN IRON ORE

Cents per unit, c.i.f. Atlantic ports
Spanish low phosphorus, 52 to 54 per cent ..... 9.00 to 10.00
Algerian low phosphorus, 52 to 54 per cent ..... 10.00 to 10.50
Swedish and Norwegian low phosphorus, 68 per cent.... 11.00 to 12.00
Swedish foundry or basic, 66 to 68 per cent ..... 9.25 to 10.00
Spanish foundry or basic, 50 to 54 per cent 9.00

Manganese Ore

Prices do not include duty at rate 1 per cent per pound of metallic manganese contained.
Brazilian, minimum 47 per cent..... .....40 to 42 cents c.i.f., tidewater
Indian, minimum 47 per cent..... .....40 to 42 cents c.i.f. tidewater
Caucasian, 53 to 55 per cent..... .....46 cents c.i.f. tidewater

Fluor Spar

85 and 5 per cent grade
Washed gravel, Kentucky and Illinois mines, per net ton.$19.75 to 23.50
Washed gravel, imported, duty paid eastern tidewater, per gross ton ..... 20.60 to 21.10

Rivets

Structural rivets, Pittsburgh 2.75c to 2.90c
Rivets, 7/16-in. and smaller..... .....70 and 10 off to 65, 10 and 5 off

Nuts and Bolts

(Up to 1¼ and 1½ inches inclusive)
Hot pressed square or hexagon blank .....$4.25 off list
Hot pressed square or hexagon tapped .....$4.25 off list
Cold punched square or hexagon blank .....$4.00 off list
Cold punched, square or hexagon... .....$4.00 off list
Cold punched semifinished hexagon nuts ⅝-inch and larger.....75 and 5 off
Cold punched semifinished hexagon nuts 9/16-inch and smaller.....80 and 5 off
Price f.o.b. Pittsburgh, packages of 50.

CARRIAGE BOLTS

(¾ x 6 inches, smaller and shorter)
Rolled thread .....60 and 5 off
Cut thread .....50, 10 and 5 off
Larger and longer.....50, 10 and 5 off

MACHINE BOLTS

(⅜ x 4 inches, hot pressed nuts)
Rolled thread .....60, 10 and 5 off
Cut thread .....60 and 5 off
Larger and longer .....60 and 5 off
(⅜ x 4 inches, cold punched nuts)
Cut thread .....50, 5 off
Larger and longer .....50, 5 off
Lag screws .....65 and 5 off
Plow bolts Nos. 1, 2 and 3 heads.... ..... 50 and 10 off
4 to 10 heads .....50-10 + 20 off
Flat and round head stove bolts..... ..... 75, 10 and 5 off
Other stove bolts .....75 and 5 off
Tap bolts .....25 and 10 off
Bolt ends with hot pressed nuts..... .....60 nd 5 off
Bolt ends with cold punched nuts.... .....50 and 5 off
Blank bolts .....60 and 10 off
Rough stud bolts with nuts..... .....45 and 5 off

Washers

Wrought washers .....$5.00 to $5.50 off

Steel Pipe

(Effective April 19, 1923)
Pittsburgh basing discounts, jobbers' carloads.

	Black	Galvanized
Butt Weld		
⅛-inch	45	19½
¼ and ⅜-inch	51	25½
½-inch	56	42½
¾-inch	60	48½
1 to 3-inch	62	50½
Lap Weld		
2-inch	55	43½
2½ to 6-inch	59	47½
7 to 8-inch	56	43½
9 and 10-inch	54	41½
11 and 12-inch	53	40½
REAMED AND DRIFTED		
Butt Weld		
1 to 3-inch	60	48½
Lap Weld		
2-inch	53	41½
2½ to 6-inch	57	45½
EXTRA STRONG—PLAIN ENDS		
Butt Weld		
⅛-inch	41	24½
¼ and ⅜-inch	47	30½
½-inch	53	42½
¾-inch	58	47½
1 to 1½-inch	60	49½
2 to 3-inch	61	50½
Lap Weld		
2-inch	53	42½
2½ to 4-inch	57	46½
4½ to 6-inch	56	45½
7 to 8-inch	52	39½
9 and 10-inch	45	32½
11 and 12-inch	44	31½
DOUBLE EXTRA STRONG		
Butt Weld		
½-inch	42	32½
¾ to 1½-inch	45	35½
2 to 2½-inch	47	37½
Lap Weld		
2-inch	41	32½
2½ to 4-inch	43	34½
4½ to 6-inch	42	33½
7 to 8-inch	38	25½

Wrought Iron Pipe

(Effective Jan. 23, 1923)
Pittsburgh basing discounts, jobbers, carloads

THREADS AND COUPLINGS		
Butt Weld		
¼ and ⅜-inch	+11	+39
½-inch	22	2
¾-inch	28	11
1 to 1½-inch	30	13
Lap Weld		
1¼ and 1½-inch	Upon application	
2-inch	23	7
2½ to 6-inch	26	11
7 to 8-inch	28	13
7 to 12-inch	26	11
PLUGGED AND REAMED		
Two points less than above		
EXTRA STRONG, PLAIN ENDS		
Butt Weld		
¼ and ⅜-inch	+19	+54
½-inch	21	7
¾-inch	28	12
1 to 1½-inch	30	14
Lap Weld		
2-inch	23	9
2½ to 4-inch	29	15
4½ to 6-inch	28	14
7 to 8-inch	21	7
9 to 12-inch	16	2
DOUBLE EXTRA STRONG		
Butt Weld		
½-inch	+47½	+59½
¾-inch	+28	+40
1-inch	+34	+46
1¼-inch	+28	+40
1½-inch	+27	+39
Lap Weld		
2 and 2½-inch	+13	+25
3 to 4-inch	+ 8	+17
4½ to 6-inch	+ 9	+18
8-inch	+12	

Boiler Tubes

L. C. L. discounts. C. L. 4 points larger

STEEL (Lap welded)
(Effective April 19, 1923)

2 and 2¼-inch	23 off
2½ and 2¾-inch	33 off
3-inch	36 off
3¼ to 3¾-inch	38½ off
4 to 13-inch	42 off

CHARCOAL IRON
(Effective April 12, 1923)

1½-inch	+22
1¾-inch	+12
2 and 2¼-inch	+ 2
2½ to 3-inch	3
3¼ to 4½-inch	5

SEAMLESS COLD DRAWN
(Effective April 19, 1923)

1-inch	51 off
1¼ and 1½-inch	43 off
1¾-inch	27 off
2 and 2¼-inch	18 off
2½ and 2¾-inch	28 off
3 and 3¼-inch	32 off
3½ and 3¾-inch	33 off
4-inch	37 off
4½ and 5-inch	29 off

SEAMLESS HOT ROLLED

3 and 3¼-inch	34 off
3½ and 3¾-inch	35 off
4-inch	39 off

SEAMLESS STEEL MERCHANT BOILER TUBES

Extras:
Add $8 per net ton for more than four gages heavier than standard and add 10 per cent to theoretical weight
Add 5 per cent for lengths over 24 feet and not over 26 feet.
Smaller tubes than 1-inch and lighter than standard gage to be sold at mechanical tubing list and discount.
Intermediate sizes and gages not listed above take price of next larger outside diameter and heavier gage.

SEAMLESS STEEL MECHANICAL TUBING
Base Discounts

Carbon, 0.10 to 0.20 per cent.....	83 off
Carbon, 0.30 to 0.40 per cent.....	81 off
Carbon, 0.40 to 0.50 per cent....net price	

Plus differentials and extras for cutting.

SEAMLESS STEEL LOCOMOTIVE AND SUPERHEATER TUBES
(Effective April 19, 1923)

Outside diameter	Net prices per foot f.o.b. Pittsburgh Gage	Price
2-inch	12-gage	15c
2-inch	12-gage	15c
2-inch	11-gage	16c
2-inch	10-gage	17c
2¼-inch	12-gage	17c
2¼-inch	11-gage	18c
2¼-inch	10-gage	20c
3-inch	7-gage	35c
1½-inch	9-gage	15c
5⅜-inch	9-gage	55c
5½-inch	9-gage	57c

Plus usual extras for forming and for long lengths.

Hot Rolled Alloy Steels

Prices per pound, Pittsburgh

S. A. E. Series—	
2300 (3½ per cent nickel).....	5.00 to 5.25c
3100 (nickel chromium).....	4.00 to 4.25c
6100 (chrome vanadium).....	5.00c
6100 (chrome vanadium spring)	4.75c
9250 (Silico manganese spring)	3.90c

SIVYER CASTINGS
DEPENDABLE

Coal bucket gate latch cast in Sivyer Vanadium Electric Alloy

Tool steel service with Sivyer Alloy

THE steel part shown above used to be very expensive. Two pieces of tool steel were welded into the nose of the casting—a very expensive operation—to defeat the heavy wear that the latching and unlatching of the bucket gate entailed at that point. The consulting engineer, of the firm using the piece, wanted to cut down the excessive cost of the welding and finishing. He asked a Sivyer representative for suggestions. A casting of Sivyer Electric Vanadium Steel, specially heat treated and quenched to harden the nose, was recommended. This Sivyer alloy casting is simple and inexpensive, compared to the composite piece formerly used, because of the elimination of the costly welding and finishing operations—and the service rendered is at least as good.

Send Blue Prints

If you are confronted with problems, similar to the one described here, send blue prints and a statement of your difficulties. We will be glad to study the problems involved and suggest possible solutions, without obligation on your part.

Representative Properties Annealed Castings

Sivyer Vanadium Electric Steel Castings:

Tensile strength.....85,000 lbs.
Yield Point.....50,000 lbs.
Elongation in 2".....22%
Reduction in Area.....30%

Sivyer Chrome Nickel Electric Steel Castings:

Tensile strength.....100,000 lbs.
Yield Point.....65,000 lbs.
Elongation in 2".....19%
Reduction in Area.....30%

Sivyer Chrome Electric Steel Castings:

Tensile strength.....95,000 lbs.
Yield Point.....55,000 lbs.
Elongation in 2".....18%
Reduction in Area.....25%

Sivyer Alloy Steels can be tempered by heating and quenching

SIVYER STEEL

SIVYER STEEL CASTING COMPANY, MILWAUKEE

Iron and Steel Scrap Prices

CORRECTED TO TUESDAY NOON **GROSS TONS DELIVERED TO CONSUMER**

Steel Works Scrap

HEAVY MELTING STEEL

Birmingham	14.00 to 15.00
Boston (dealers)	15.00 to 15.50
Buffalo	20.50 to 21.00
Chicago	18.00 to 18.50
Cleveland	19.25 to 19.50
Cincinnati	17.50 to 18.00
Detroit (dealers)	18.00 to 18.50
Eastern Pennsylvania	19.50 to 20.00
New York (dealers)	15.50 to 16.00
Pittsburgh	22.00 to 23.00
St. Louis	17.50 to 18.00
Valleys	21.50 to 22.00
No. 1 railroad steel New York (dealers)	15.75 to 16.25

COMPRESSED SHEETS

Buffalo	19.00 to 19.50
Chicago	15.00 to 15.50
Cleveland	17.75 to 18.00
Detroit (dealers)	16.00 to 16.50
Pittsburgh	20.50 to 21.00
Valley	19.00 to 19.50

BUNDLED SHEETS

Buffalo	14.50 to 15.00
Cincinnati	13.00 to 13.50
Cleveland	14.75 to 15.00
Detroit	12.50 to 13.00
Eastern Pennsylvania	16.50
Pittsburgh	18.50 to 19.00
St. Louis	11.00 to 11.50
Valley	16.25 to 16.50

SHEET CLIPPINGS, LOOSE

Chicago	12.00 to 12.50
Detroit	12.00 to 12.50

STEEL RAILS, SHORT

Birmingham	12.00 to 13.00
Boston (dealers)	15.00 to 15.50
Chicago	20.50 to 21.00
Cincinnati	21.00 to 21.50
Cleveland (over 6 pt.)	18.25 to 18.50
St. Louis	20.50 to 21.00

STOVE PLATE

Birmingham	16.00 to 17.50
Boston (consumers)	16.50 to 17.00
Buffalo	18.00 to 18.50
Pittsburgh	16.00 to 16.50
Chicago	19.00
Cincinnati (net iron)	13.50 to 14.00
Cleveland	19.00 to 19.25
Detroit (net ton) (dealers)	15.50 to 16.00
Eastern Pennsylvania	17.50 to 18.00
New York (dealers)	14.00 to 14.50
Pittsburgh	17.00 to 17.50
St. Louis	19.50 to 20.00

LOW PHOSPHORUS

Buffalo	24.00 to 25.00
Cincinnati	17.50 to 18.00
Eastern Pennsylvania	24.00 to 25.00
Pitts., billets and bloom crops	24.50 to 25.50

SHOVELING STEEL

Chicago	17.75 to 18.25
Pittsburgh	17.50 to 18.00
St. Louis	17.25 to 17.75

KNUCKLES, COUPLERS, SPRINGS

Chicago	21.00 to 21.50
Eastern Pennsylvania	23.00 to 23.50
Pittsburgh	24.00 to 24.50
St. Louis	22.00 to 22.50

FROGS, SWITCHES, GUARDS

Chicago	18.75 to 19.00
Eastern Pennsylvania	19.50 to 20.00
St. Louis	18.50 to 19.00

BOILER PLATE, CUT

St. Louis	12.25 to 12.75

ANGLE BARS—STEEL

Chicago	19.50 to 20.00
St. Louis	19.00 to 19.50

Iron Mill Scrap

RAILROAD WROUGHT

Birmingham	12.00 to 13.00
Boston dealers)	14.50 to 15.00
Buffalo	18.00 to 19.00
Cleveland, No. 1	17.00 to 17.25
Chicago, No. 1	17.50 to 18.00
Chicago, No. 2	18.00 to 18.50
Cincinnati No. 1	14.50 to 15.00
Detroit, No. 2	18.00 to 18.50
Eastern Pennsylvania	22.00 to 23.00
New York, No. 1 (dealers)	17.00 to 17.50
Pittsburgh, No. 1	17.50 to 18.00
Pittsburgh, No. 2	22.00 to 23.00
St. Louis, No. 1	17.50 to 18.00
St. Louis, No. 2	17.50 to 18.00

WROUGHT PIPE

Boston (dealers)	13.00 to 13.50
Buffalo	14.50 to 15.00
Eastern Pennsylvania	19.00
New York (dealers)	17.50 to 18.00

YARD WROUGHT

Boston	14.00 to 14.50
Eastern Pennsylvania	20.00 to 21.00

CITY WROUGHT

New York, long	16.50 to 17.50

BUSHELING

Buffalo	18.50 to 19.00
Chicago, No. 1	16.25 to 17.00
Chicago, No. 2	11.25 to 11.75
Cincinnati, No. 1	13.50 to 14.00
Cleveland, No. 1	15.25 to 15.50
Cleveland, No. 2	14.00 to 14.25
Detroit, No. 1	14.00 to 14.50
Detroit, No. 2 (new)	14.00 to 14.50
Detroit, No. 2 (old)	11.00 to 11.50
Eastern Pennsylvania	16.00 to 17.00
Pittsburgh, No. 1	18.50 to 19.00
St. Louis, No. 1	17.00 to 17.50

MACHINE SHOP TURNINGS

Birmingham	7.00 to 9.00
Boston (dealers)	11.00 to 11.50
Buffalo	14.00 to 14.50
Chicago	11.00 to 11.50
Cincinnati	11.50 to 12.00
Cleveland	16.00 to 16.25
Detroit (dealers)	12.50 to 13.00
Eastern Pennsylvania	16.00 to 16.50
New York (dealers)	12.75 to 13.25
Pittsburgh	16.50 to 17.00
St. Louis	10.50 to 11.00
Valleys	15.00 to 15.25

CAST IRON BORINGS

Birmingham (chemical)	15.00 to 16.00
Birmingham (plain)	9.00 to 10.00
Boston (chemical)	12.00 to 12.50
Boston (dealers)	12.00 to 12.50
Buffalo	14.50 to 15.00
Chicago	15.00 to 15.50
Cincinnati	13.00 to 13.50
Cleveland	17.00 to 17.25
Detroit (dealers)	13.25 to 13.75
Eastern Pennsylvania (chem.)	18.00 to 18.50
Eastern Pennsylvania	16.00 to 16.50
New York (dealers' price)	12.75 to 13.25
Pittsburgh	17.50 to 18.00
St. Louis	14.00 to 14.50
Valleys	16.25 to 16.75

MIXED BORINGS AND TURNINGS
(For blast furnace use)

Boston (dealers)	11.00 to 11.50
Cleveland	16.75 to 17.00
Detroit (dealers)	12.75 to 13.25
Eastern Pennsylvania	15.00 to 16.00
New York (dealers)	12.25 to 12.75

IRON AXLES

Birmingham	21.00 to 22.00
Boston (consumers)	31.00 to 32.00
Buffalo	30.00
Chicago	30.00 to 30.50
Cincinnati	24.00 to 24.50
Eastern Pennsylvania	28.00 to 30.00
New York (dealers)	25.75 to 26.25
St. Louis	29.50 to 30.00

IRON RAILS

Buffalo	21.00 to 22.00
Chicago	21.00 to 21.50
Cincinnati	16.50 to 17.00
St. Louis	17.50 to 18.00

PIPES AND FLUES

Chicago	14.25 to 14.75
Cincinnat	11.50 to 12.00
Cleveland	15.00 to 15.25
St. Louis	13.75 to 14.25

RAILROAD GRATE BARS

Buffalo	17.50 to 18.00
Chicago	18.75 to 19.25
Cleveland	19.00 to 19.25
Eastern Pennsylvania	17.50 to 18.50
New York (dealers)	14.25 to 14.75
St. Louis	19.50 to 20.00

FORGE FLASHINGS

Boston (dealers)	10.50 to 11.00
Chicago, small	13.50 to 14.00
Cleveland, (under 10 in.)	14.75 to 15.00
Cleveland, (over 10 in.)	14.25 to 14.50
Detroit (dealers)	13.00 to 13.50

FORGE SCRAP

Boston (dealers)	10.50 to 11.00
Chicago	21.00 to 22.00
Eastern Pennsylvania	16.00 to 17.00

ARCH BARS AND TRANSOMS

Chicago	23.00 to 23.50
St. Louis	24.00 to 24.50

ANGLE BARS—IRON

Chicago	23.00 to 23.50
St. Louis	24.00 to 24.50

Iron and Steel Works Scrap

AXLE TURNINGS

Boston (dealers)	11.00 to 11.50
Buffalo	16.00 to 16.50
Chicago	16.00 to 16.50
Cleveland	17.00 to 17.25
Eastern Pennsylvania	16.00 to 16.50
Pittsburgh	19.00 to 19.50
St. Louis	14.00 to 14.50

STEEL CAR AXLES

Birmingham	19.00 to 20.00
Boston (consumers)	20.00 to 21.00
Buffalo	21.00 to 22.00
Chicago	22.00 to 22.50
Cleveland	22.00 to 24.00
Eastern Pennsylvania	26.00 to 28.00
New York (dealers)	19.00 to 19.50
Pittsburgh	24.00 to 24.50
St. Louis	22.50 to 23.00

SHAFTING

Boston (consumers)	21.00 to 22.00
Chicago	24.50 to 25.00
Eastern Pennsylvania	23.00 to 25.00
New York (dealers)	17.25 to 18.25
St. Louis	23.00 to 23.50

Iron Foundry Scrap

CAR WHEELS

Birmingham, tram car	17.00 to 18.00
Birmingham, iron	16.00 to 17.00
Boston (consumers)6	20.00 to 20.50
Buffalo	20.50 to 21.00
Chicago, iron	21.00 to 21.50
Cincinnati	15.50 to 16.00
Eastern Pennsylvania	18.50 to 19.50
New York iron (dealers)	15.75 to 16.25
Pittsburgh, iron	20.50 to 21.00
Pittsburgh, steel	24.00 to 24.50
St. Louis, iron	20.50 to 21.00

NO. 1 CAST SCRAP

Birmingham, cupola	19.50 to 20.00
Boston (consumers)	22.50 to 23.00
Buffalo	20.00 to 20.50
Chicago, cupola	22.50 to 23.00
Cincinnati No. 1 machinery cupola (net tons)	21.00 to 21.50
Cleveland, cupola	21.75 to 22.00
Detroit (net tons) (dealers)	18.50 to 19.00
Eastern Pennsylvania, cupola	20.50 to 21.00
New York, cupola (dealers)	17.75 to 18.25
Pittsburgh, cupola	21.00 to 21.50
San Francisco	25.00 to 26.00
St. Louis, railroad	21.50 to 22.00
St. Louis, agricultural	21.00 to 21.50
Valleys	22.00 to 23.00

HEAVY CAST

Boston (consumers)	19.50 to 20.00
Buffalo (breakable)	17.00 to 17.50
Cleveland	17.00 to 17.50
Detroit (automobile) (net ton)	22.50 to 23.00
Eastern Pennsylvania	18.50 to 19.00
New York (dealers)	17.00 to 17.50
Pittsburgh	19.50 to 20.00

MALLEABLE

Boston (railroad)	19.00 to 20.00
Buffalo	22.00 to 23.00
Chicago, railroad	21.50 to 22.00
Chicago, agricultural	20.50 to 21.50
Cincinnati, agricultural	17.00 to 17.50
Cincinnati, railroad	17.00 to 17.50
Cleveland, agricultural	20.50 to 21.00
Cleveland, railroad	21.50 to 21.75
Detroit (dealers)	18.00 to 18.50
Eastern Pennsylvania, railroad	17.00 to 18.00
Pittsburgh, railroad	19.50 to 20.00
St. Louis, agricultural	18.50 to 19.00
St. Louis, railroad	19.50 to 20.00

Miscellaneous Scrap

RAILS FOR ROLLING
5 feet and over

Birmingham	16.00 to 16.50
Boston (dealers)	16.00 to 16.25
Chicago	20.00 to 20.50
Cleveland	20.00 to 21.00
Detroit	18.50 to 19.00
Eastern Pennsylvania	21.00 to 22.00
New York (dealers)	18.50 to 19.00
Pittsburgh district	23.50 to 24.00
St. Louis	19.50 to 20.00

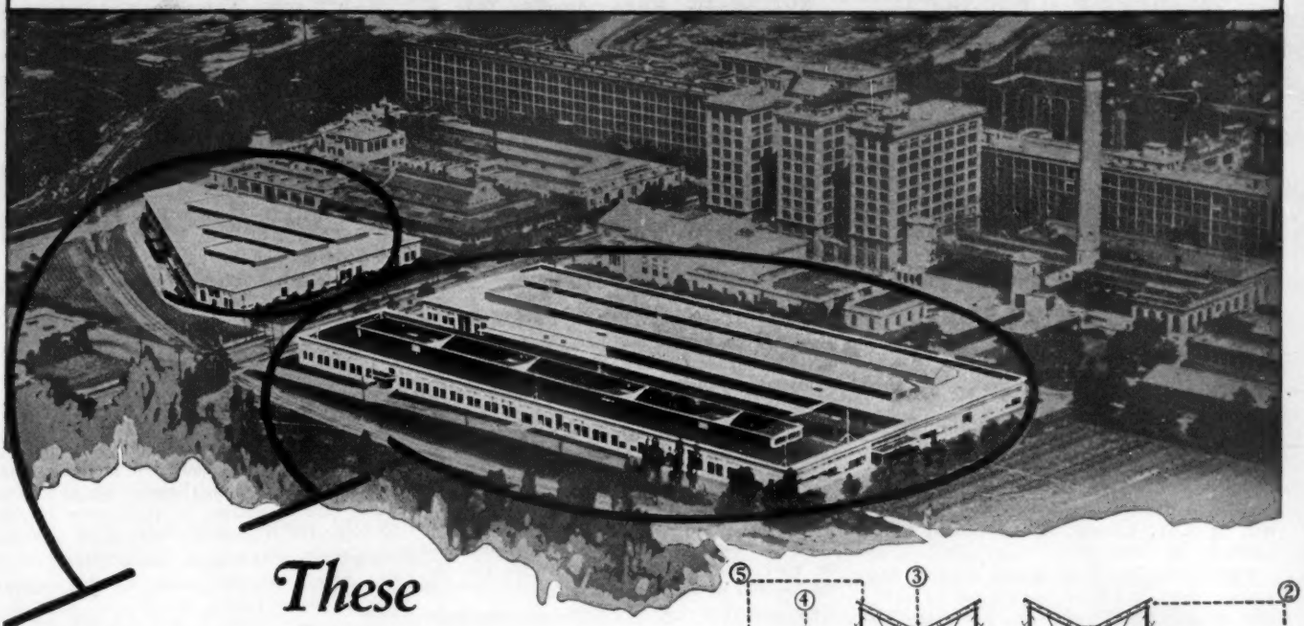
LOCOMOTIVE TIRES

Chicago	20.00 to 21.00
St. Louis	18.50 to 19.00

LOW PHOSPHORUS PUNCHINGS

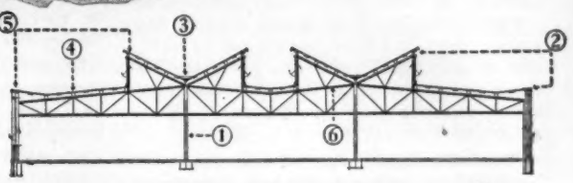
Chicago	19.50 to 20.00
Eastern Pennsylvania	23.00 to 24.00
Pittsburgh	24.00 to 24.50

AT THE NATIONAL CASH REGISTER PLANT—DAYTON



This is the Total Area *of* Competing Standard Buildings

These are FERGUSON STANDARD BUILDINGS *at the* NATIONAL CASH REGISTER PLANT



These are the Reasons why The National Cash Register Co. bought Ferguson Buildings

1. An average of over 2000 square feet of unobstructed floor space for every column.
2. More than usual amount of daylight. Four lights high of sash in monitor, and additional light at top of sidewalls. Interior lighting is uniform because under side of the "V" monitor, painted white, reflects monitor light as needed to equalize light *over all floor area.*
3. Better ventilation insured by the "V" monitor, which acts as a deflecting surface for incoming air.
4. Better drainage provided by roof with three times more than usual roof pitch.
5. No drip over, from monitor or roof, as all drainage is inside the building, where down-spouts can't freeze.
6. These buildings are from five to ten degrees cooler in summer by actual test on account of increased head room and better distribution of air currents.
7. Each truss is designed to carry five tons distributed load of monorails or shafting. Elevated toilets, locker rooms, heating pipes or ducts, may be carried on the trusses.
8. Architectural treatment of exterior may be made to harmonize with any existing plant.

For further information—come, telephone or wire. Write for booklet "C"

Our Vice President is in Japan

We are in position to put forward engineering and construction work in Japan with the utmost expedition under the personal supervision of our Vice President on the ground.

THE H. K. FERGUSON COMPANY, Cleveland
4900 Euclid Building ∴ ∴ Telephone, Randolph 6854

Ferguson
GUARANTEED BUILDINGS

Construction and Enterprise

(*Continued from page* 442)

$5000 to manufacture ornamental brass, bronze and steel for buildings, by Raymond E. Watson, Henry A. Stromsem and Harold Stromsem.

CHICAGO—Stalnaker & Boone Co., 7420 Cottage Grove avenue, has been incorporated for $75,000 to manufacture and deal in automobile parts, and accessories, by Sara Stalnaker, W. E. Stalnaker and W. J. Boone.

CHICAGO—Gayle Coal Co., 209 South La Salle street, has been incorporated for $500,000 to mine and deal in coal, ore and minerals, by George O. Clinch, E. Searls and R. Cloyd and Clinch Goodrich.

CHICAGO — Schuryler-Hildman Co., 160 North Wells street, has been incorporated for $50,000 to manufacture and deal in linotype supplies and machinery, by J. M. Garifola, C. L. Thoele and Frederick Hildman.

CHICAGO—Automatic Linking Machine Co., 1326 South Dearborn street, has been incorporated for $15,000 to manufacture and deal in automatic machines, electric motors, etc., by S. T. Lawson, S. R. Wittelle, F. E. Gehrke.

CHICAGO—The Tater Flakes Co., 20 East Jackson street, has been incorporated for $150,000 to manufacture and sell, or repair machines and machinery for manufacturing, cooking or preparing food, by William M. Kelly, A. Arthur Yort and Forrest L. Morrow.

CHICAGO—Foote Gear Works, Inc., 430 North Oakley boulevard, has been incorporated for $200,000 to manufacture and deal in gears, tools and machinery, by F. Harold Bennett, Bradford Foote and P. E. Jarrett. Equipment has been purchased. *Noted Dec.* 20.

ROBINSON, ILL.—Robinson Gas Co., 101 West Walnut street, has been incorporated for $150,000 to manufacture and deal in gas, coke and residual products, by Thomas Flynn, W. J. Hartnett, J. A. Sloan and L. W. Singleton.

CRAWFORDSVILLE, IND—The Ingot Iron Railway Products Co. has been incorporated for $50,000 to manufacture iron products, by Walter H. O'Neill, Weber Sebald, Jay D. Frazer and Horace W. Rinearson.

BOSTON—Gilman Mfg. Co. has been incorporated for $1,000,000 to manufacture and deal in machinery, tools, etc.

BOSTON—The Geier Co. of Massachusetts has been incorporated to manufacture and deal in machinery of all kinds, with $100,000 capital by F. J. Gottron and James A. Farrell, Cleveland, and J. Hall, of Boston.

BOSTON—The Eastern Motor Parts Co. has been incorporated for $50,000 by Frank K. Kerr, Somerville, Mass.; Emma Bond, Everett, Mass., and Vera G. Stanton, Forest Hills, Mass.

FALL RIVER, MASS.—Mt. Hope Electric Co. will build 1-story, 200 x 228-foot power house here of brick and concrete.

FITCHBURG, MASS.—L. H. Goodnow foundry was damaged by fire with loss of about $40,000 to pattern department.

NATICK, MASS.—The Halperin Motor Corp. has been incorporated for $25,000 by Edith Halperin, Samuel Halperin and Jeremiah F. Kiley.

WALTHAM, MASS.—The Colonial Motor Coach Corp. has been incorporated for $300,000 by James G. Murray and Peter J. Dagan, Waltham; Charles W. Hodsdon, Brookline, Mass.; John F. Lowell, Woburn, Mass., and Winsor H. Wyman, of Abingdon, Mass.

WORCESTER, MASS.—The Wheeldon Co. has been incorporated for $150,000 to manufacture special fine steel wires, by John Wheeldon, formerly general manager of the Wickwire Spencer Steel Corp.

WORCESTER, MASS.—American Steel & Wire Co. plans $500,000 electric cable plant addition. Clinton S. Marshall, 94 Grove street, is district manager.

KALAMAZOO, MICH.—C. G. Spring Co. plans extensions following recent successful disposition of $550,000 of common and preferred stock.

KANSAS CITY, MO.—Unit Motor Co., 2615-9 Walnut street, will move into new quarters at Fourteenth and Chestnut streets about April 1. Installation of heavy machinery and general expansion are provided for in 1924 program.

ST LOUIS—Cosmos Electric Plant & Supply Co. has been incorporated for $30,000 to manufacture and deal in electric light and power plants and equipment, by V. P. Gabriel, W. H. Spear and J. Carter Carstens.

NEWARK, N. J.—Squier, Schilling & Skiff, 357 Washington street, has been incorporated for $100,000 to manufacture and deal in hardware, tools and mill supplies.

AMSTERDAM, N. Y.—The Adirondack Light & Power Co. has just placed a contract for steel with the Shoemaker Bridge Co. for the erection of a new power plant.

BROOKLYN, N. Y.—Everett Bedstead Foundry Co. has been incorporated for $5000 by L. and F. and R. Rosengarten, with D. Rosengarten, 565 West 189th street, New York, as attorney.

BROOKLYN, N. Y.—John Maxwell's Son has been incorporated for $50,000 to make gages and dies by A. M. Bohn, H. M. Kruse, with C. W. Philipbar, 215 Montague street, as attorney.

NEW YORK—United Electric Light & Power Co., 130 East Fifteenth street, plans alterations to its Hell Gate power plant.

NEW YORK—A $90,000, 2-story shop and storage building, 72 x 250 feet, will be erected at Maspeth, L. I., by Turner Construction Co., 242-44 Madison avenue.

NEW YORK—Terminal Steel Supply Corp. has been incorporated for $25,000 by C. L. Altemus, C. H. Lawson and F. H. Niles, with Palmer & Sevies, 46 Cedar street, as attorney.

NEW YORK—Swordloff Bros. Co. has been incorporated for $20,000 to carry on scrap iron business by I. and S. Swordloff with I. Frankenburg, 31 First street, as attorney.

NEW YORK—Public Household Supply Co. has been incorporated for $20,000 to make aluminum ware by M. Bloom, W. Paulen and R. Fish, with H. Gilbert, 38 Park Row, as attorney.

NEW YORK—Krajewski-Pesant Mfg. Co. has been incorporated for $25,000 to make engines, by J. B. Knox, R. P. Buell and C. H. Stanton, with Graham, McMahon, Buell & Knox, 163 Broadway, as attorney.

NEW YORK—Industrial Inventions Corp. has been incorporated with 100 shares no par value common stock, to make machinery, by E. L. Hull, S. C. and E. Harris, with F. J. Knorr, Albany, as attorney.

NEW YORK—Adroit Tool Co. has been incorporated for $24,000 to make electric and radio devices, by J. E. and E. Young and E. J. Beckley, with Bean, Callender & Cullen, 45 Wall street, as attorney.

NEW YORK—William O. Chapman Co. has been incorporated for $35,000 to manufacture wire cloth and make iron, by W. O. Chapman, V. Kromm and F. A. Butler, with Perkins & Butler, 38 Park Row, as attorney.

NEW YORK—Dowell Indicator Corp. has been incorporated for $250,000 to manufacture automobile temperature recording devices, by W. D. Boyer, J. M. McCall and M. C. Travers, with P. J. Morris, 936 West End avenue, as attorney.

NEW YORK—A $40,000 sheet metal plant will be erected by M. F. Westergrin, Inc., 1213 East 144th street. According to plans, by A. E. Cavis 259 East 138th street, architect, the proposed structure will be four stories high, 30x100 feet.

WILMINGTON, N. C.—Tidewater Power Co. will start soon on $600,000 extension program.

ATHENS, O.—Athens Foundry & Machine Co. has been sold to E. E. Jacobs. Plant is to be renovated and extended.

BELLAIRE, O.—The Bellaire Enamel Co. will rebuild immediately its plant damaged by fire Jan. 26.

CLEVELAND—The American Slag & Supply Co. has been incorporated for $50,000 by Jerome A. Haas, Thomas F. Murphy, Ben Schwartz, A. S. Brien and J. A. Klein.

CLEVELAND—The Frankelite Co., D. Frankel, 5016 Woodland avenue, vice president, plans 1 story, 60 x 87-foot, 3-story, 56 x 130-foot factory and warehouse to cost about $75,000. A. Sogg, 319 Hippodrome building, is architect.

DAYTON, O.—Rieck Sheet Metal Co., Ben Rieck, president, plans $50,000 expenditure on improvements and 2-story building.

DAYTON, O.—Extensive improvements to the plant of the Maxwell Motor Car Co., North Dayton plant, are planned.

SIDNEY, O.—The Sidney Electric Mfg. Co. has been incorporated for $30,000 to manufacture electrical equipment by George B. Quatman, A. G. Eldenmiller, Lester W. Eldenmiller, R. C. Kester and Warren Dohner.

SPRINGFIELD, O.—Wickham Piano Plate Co. has awarded contract to H. K. Ferguson Co., Cleveland, for construction of 1-story, 62 x 195-foot brick and steel foundry.

TOLEDO, O.—Industrial Steel Casting Co., Millard avenue and Front street, Joseph Tillman Sr., president and general manager, is building 80 x 102-foot plant for foundry molding use. Larger additions are contemplated for spring construction.

WARREN, O.—The Reliance Steel & Construction Co. has been incorporated for $25,000 by D. R. Gilbert, A. E. Wonders, M. I. Jeffries and M. J. Sloan.

PORTLAND, OREG.—Pacific Blowpipe Co. has been incorporated for $25,000 by J. S. Middleton, Yeon building.

PORTLAND, OREG.—American By-Products Co. has been incorporated for $2,000,000 to engage in mining, milling, etc., by W. D. Bennett, 412 Con Securities building.

ERIE, PA.—Germer Stove Works was damaged by fire Jan. 28 with about $15,000 loss.

ETNA, PA.—Etna Supply Co., owned and operated by Spang-Chalfant Co., Pittsburgh, pipe manufacturer, was damaged by fire Jan. 18. The 2-story building and all contents were badly damaged.

MEADVILLE, PA.—Erie Railroad Co. plans expenditure of $950,000 for increased shop facilities and $100,000 for shop equipment here.

NEW BRIGHTON, PA.—The Pittsburgh Rust Proof & Mfg. Co. has been formed with $50,000 capital to manufacture and sell hardware or other articles and the rust proofing of same by Birger F. Burman, Beaver; Albert Stammelbach, Beaver; and F. W. Narr Jr., New Brighton.

NEW BRIGHTON, PA.—The William Leard Co., Inc., has been incorporated for $350,000 to manufacture iron, steel, metals and metal products, engines, motors, pumps, machinery, etc., by William S. Leard, Beaver, Pa.; Charles H. Vaughan, College Hill, Pa., and Harry Calhoun, New Brighton.